MATERIALS TOWARD A MONOGRAPH OF THE GENUS VERBENA. XXIII

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VERBENA PLATENSIS Spreng.

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Illustrations: Paxt., Mag. Bot. 5: 243 [in color] & 244. 1838; Floricult. Cab. 7: 22 [in color]. 1839; Hook. in Curtis, Bot. Mag. 65: pl. 3694 [in color]. 1839; Maund, Bot. Gard. 9: pl. 197 [in color]. 1839—1851; J. W. Loud., Ladies Fl.-Gard. Ornam. Perenn. 2: pl. 91 [in color]. 1844; Vilm., Alb. de Cliches, ed. 2, fig. 25685. 1888; Rév. Hort. 1896: 188. 1896; L. H. Bailey, Cycl. Amer. Hort., ed. 1, 6: 1912 & 1916. 1902; L. H. Bailey, Stand. Cycl. Hort. 6: 3445. 1917; Sanzin, Anal. Soc. Cientif. Argent. Buenos Aires 88: 112. 1919.

Annual or perennial, tufted, procumbent or creeping herb, usually 30--70 cm. tall, much branched, stiff or sometimes almost suffrutescent at the base and then to 2 feet tall; stems and branches ascending-erect or rooting at the nodes near the base, spreading-hirsute or firmly hispid, the stems subterete, the branches tetragonal; internodes abbreviated; leaves decussate-opposite, sessile or subsessile, rather rigid, green, varying from ovate, lanceolate-oblong, or subovate-elliptic to rather broadly ovate-elliptic or oblong-triangular (the lower ones usually oval or oblong, the uppermost ones triangular or lanceolate), thick-textured or almost fleshy, revolute margined or folded together, 2—5 cm. long, about 1.3 cm. wide, acute or obtuse and short-apiculate at the apex, shortly cuneate and entire at the base and narrowed into the short petiole, sinuately serrate or more or less regularly crenate or crenate-dentate with obtuse teeth above the base, the uppermost crenations 1--1.5 mm. long and 2—5 mm. apart, or irregularly and deeply incised-dentate or even subpinnatifid-dentate, more or less rugose-wrinkled and glandular-hirtellous or pilose-pubescent above, pilose-pubescent or hirsute-tomentose beneath and hispid on the venation, the venation usually more or less deeply impressed above, prominent or prominulous beneath, pinnate, anastomosing toward the margins; spikes terminal, solitary or ternate, long-pedunculate, dense or very dense, mostly considerably elongate even during anthesis with closely imbricate flowers, or at first in abbreviated spikes, glandular-hirtellous; flowers erect, fragrant in the evening and night, with the odor of jasmine (Jasminum); bractlets subulate-lanceolate to lanceolate-acute, half to one-third as long as the calyx, 5--6 mm. long, pilose and ciliate; calyx membranous, sordid-green, long-tubular, 1.2--2 cm. long, much shorter than the corolla-tube, canescent-hirtellous or densely and rather long spreading-pilose especially on the rather broad herbaceous ribs, with stipitate glands intermixed, the rim 5-dentate, the teeth short, very unequal, acute, the 3 posterior ones shorter and lanceolate, about 1.8 mm. long, the 2 anterior ones longer and lanceolate-subulate, 2--3 mm. long; corolla large, usually white or fading in age to slightly pinkish, pinkish-white, white-rosy, or "white with a rosy tinge", hypocrateriform, its tube cylindric, 2--2.5 cm. long, usually twice as long as the calyx and exserted more than 5 mm. from its apex, curvate, the limb 1.5 cm. wide, glabrous on the outside, almost regular, barbate in the throat, 5-lobed, the lobes to 6 mm. long, erecto-patent, slightly emarginate and undulate, the emarginations 1--2 mm. deep; stamens didynamous, inserted in the upper part of the corolla-tube, included; style long-exserted from the calyx after the corolla has been shed, surpassing the calyx-teeth by 5--6 mm., capillary below, dilated above; stigma laterally corniculate; fruiting-calyx spirally twisted at the apex, covered with hyaline stipitate glands; fruit 4 mm. long, the cocci 4, subterete at maturity, venose and (except for the very base) reticulate-scrobiculate on the back, the commissural face narrowly bisulcate, the testa leathery; chromosome number: 2n = 10.

The type of this handsome species was collected by Friedrich Sellow at Montevideo, Uruguay, and was deposited in the herbarium of the Botanisches Museum at Berlin, now destroyed. Macbride's photograph of it (no. 17452) is inscribed "Verbena teucrioides var. platensis". Another Sellow collection, inscribed "Brasilia" (Macbride type photo no. 34356), in the same herbarium was the type of V. scordioides. Verbena teucrioides was based on collections made by John Gillies at the Uspallata Pass and at Cerro de Portazuela in the Andes Mountains. Briquet's V. platensis var. latiuscula was based on Regnell I:A.3649 and A.3905 from Paraguari, Paraguay, collected in October, and deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques at Geneva, the former said to be "specimina densius pilosa". Briquet says "Specimina Lindmaniana ad hanc unicam varietatem pertinent. Planta 30--50 cm. alta, validor. Folia subsessilia, ovata vel latiuscule ovato-elliptica, superficie ad 3 x 1,3 cm., ± regulariter crenata, crenarum culminibus 1--1,5 mm. altis et 2--5 mm. distantibus, nunc etiam complicatis. Spicae longius pedunculatae." I regard this as typical V. platensis Spreng.

Verbena chamaedryfolia f. foliosae was based on Hassler 4428, collected on a campo near the Río Capibary, Paraguay, in September, and deposited in the Delessert Herbarium at Geneva. Of it Chodat says "forma foliosae i.e. foliis latioribus, tenuibus. Herba 0,3—0,5, petala violacea." Concerning V. platensis var. latiuscula Briquet says "Plants 30—50 cm. alta, validior. Folia subsessilia, ovata vel latiuscule ovato-elliptica, superficie ad 3 x 1,3 cm., regulariter crenata, crenarum culminibus 1—1,5 mm. altis et 2—5 mm. distantibus. Spicae longius pedunculatae. Herba 0,3—0,5 m. alta, petala violacea, in campo prope fl. Capibary, Sept., [Hassler] n. 4428; suffrutex 0,5—1 m. altus, petala cyanea, in valle fluminis Y-aca, in campo, Chololo, Dec., n. 6624; suffrutex 0,3—0,6 m. altus, petala rosea, prope Tobaty in rupestribus collium, Sept., no. 6357; suffrutex 0,3—0,6 m. altus, petala coerulea, in valle fluminis Y-aca, in campo prope Valenzuela, Jan., n. 6936. Nous rattachons encore au V. platensis var. latiuscula un échantillon unique: 'herba 0,25 cm. alta, corolla violacea, in culmine coll. Cerritom Jan. n. 102'. Cet échantillon possède des feuilles supérieures à crénelures plus denses et un calice un peu plus long. Il conviendrait pour élucidar entièrement cette forme de l'étudier sur des matériaux plus abondants."

Verbena platensis has been found in sandy rocky dry sunny soil along roadsides, rocky fields, hillsides and rocky hills, rocky mountains, rocky slopes and rocky places in general, rocky grassy slopes, meadows, campos, sandy soil by streams, in good soils and granitic soil, among igneous rocks, and in limestone regions, at altitudes of 30 to 4000 meters, blooming from September to March. Rosengurtt describes it as frequent in grassy clearings, and Haumann calls it "common" and "abundant" in Buenos Aires. On the other hand, Legrand calls it "rare" in Uruguay and Schulz says that it is "rare" in Salta, while Osten avers that it is only found on fern-covered ground.

Common names recorded for the species include "flor de vovia", "germanderartige Verbene", "germander-leaved verbena", "germander-like vervain", "margarita blanca", "margarita colorado", "margarita punza", "piedra", "verbena", "verbena blanca", "verveine odorante", and "verveine teucrioïde", while STANDARDIZED PLANT NAMES recommends the name "fragrant verbena".

The species seems to have been introduced into cultivation in 1837; in 1841 it was in cultivation in Switzerland inasmuch as it is said to have been one of the parents of V. anaïs Hort. in that year. Troncoso (1937) reports it as cultivated as an ornamental plant in gardens and parks in Buenos Aires. Bailey (1935) states that its seeds are offered to the horticultural trade by Floraire and by Vilmorin. In 1898 its seeds were offered as no. 5922 by Haage & Schmidt. Mattoon (1958) says "V. candidissima" is offered by Hirst & Son, London. In cultivation the plant is said to flower in summer and autumn. It is recorded as adventive in England by Douglas H. Kent in a letter to me dated November 28, 1949 — cfr. also Rep. Bot. Exch. Club Brit. Isles 1927: 452 (1928) where a Melville & Smith collection from Dagenham, Essex, is recorded.

Lemaire (1842) gives the following interesting description: "La Verbena teucrioides fut découverte pas le docteur Gillies sur les parties les plus élevées des monts Uspalata, au Chili, à plus de 3,250 mètres au dessus du niveau de la mer. Elle fut trouvée plus tard croissant aussi sur les montagnes des environs de Montevideo, ainsi que sur le Pain-de-Sucre, dans la province de Buenos-Ayres. C'est une plante presque suffrutiqueuse, dressée, rameuse, s'élevant à environ 60--70 centimétres de hauteur, couverte de toutes parts de poils raides, souvent glanduleux; munie de feuilles lancéolées-oblongues, profondément incisées, sessiles; à nervures enfoncées profondément sur la face supérieure, saillantes inférieurement; à fleurs nombreuses, en épis terminaux, allongés, serrés, et à calyces allongés, se tordant après l'anthèse. Ces fleurs, d'un blanc jaunâtre passant au blanc rosé, exhalent une odeur très suave rappelant assez l'arôma de Jasmin, et dont l'intensité est surtout remarquable de soir et pendant la nuit."

Rümpler (1873) describes it: "Brasilien. -- Einjährig, im Gewächshause ausdauernd. -- Mehr oder weniger steifhaarige Pflanze mit sehr verästentem Stamme, die Aeste aud dem Boden liegend, hier sich einwurzelnd, dann aufrecht, bis 30--40 Centimeter hoch werdend. Blätter gegenständig, kaum gestielt, die unteren oval oder länglich, die oberen fast dreieckig, lanzettlich, alle ungleich eingeschnitten-gezähnt. Blumen sehr wohlriechend, weisz oder rosaweisz, in einfachen oder dreizähligen, Anfangs dichten und doldenartigen, dann verlängerten Trauben; jede Blume hat ein pfriemliches, behaartes Deckblatt, das zwei Mal kürzer, als der Kelch, welcher seinerseits wieder viel kürzer ist, als die Röhre der Blumenkrone. Letztere ist grosz, auszen glatt, mit fast regelmäszigem, am Schlunde bärtigem Saume mit schwach ausgerandeten Lappen......Dieser Art hat durch die Kultur nicht unbedeutende Abänderungen erfahren; man betrachtet sie und die folgende als den Ausgangspunkt fast aller jetzt in den Gärten kultivierten Varietäten."

Rosengurtt (1946) calls it "Mala hierba perenne, hemicriptófita paquiriza de tallos radicantes perennes estolonifromes; florece en primavera, prolongándose hasta el verano; las flores son fragrantes y decorativas. Vive en campos vírgenes, pobres y balastosos, o pedregosos."

Briquet (1904) says "Schauer avait cité dubitativement le V. platensis à propos du V. teucrioides Gill. et Hook. M. O. Kuntze à la premier établi la synonymie des V. platensis et V. teucrioides par l'examen des originaux de Sprengel. De notre coté, nous possédons à l'Herbier Delessert la plante de Sellow sur laquelle Sprengel à basé son V. platensis et qui a plus tard été décrite à nouveau par Chamisso sous le nom de V. scordioides. La synonymie ci-dessus nous paraît donc maintenant définitivement élucidée.... Le V. platensis ayant souvent été confondu avec d'autres espèces du group, nous croyons utile d'en donner ici une description complète." Whereupon he gives a detailed description, in which, however, he makes the amazing statement that "Corolla coerulea vel violacea" — apparently indicating that the only specimen or specimens before him which gave any indication of corolla color on their labels were of f. violacea Moldenke.

He continues: "Le V. platensis se distingue aisément du V. megapotamica par sa taille moins élevée, ses feuilles sessiles ou sub-sessiles, son inflorescence nullement capitulée à la fin de l'anthèse, son calice moins longuement cylindrique à nervures longuement poilues-ciliées etc. Il se sépare aussi sans peine du V. chamaedrifolia Juss. (in Ann. Mus. VII, 73, ann. 1807); Briq. Verb. Balans. Par. p. 2. = V. peruviana O. Kuntze Rev. III, 2, 257; non Britton = Erinus peruvianus L. Sp. ed. 1, p. 630, ann. 1753). Ce dernier type s'en écarte par son calice notablement plus court (ne dépassant pas 1 cm. de longueur) à dents plus courtes, ses tiges procombantes et grêles, ses feuilles élargis et très brusquement rétrécies en un court pétiole à la base etc. On a d'ailleirs très souvent confondu de V. chamaedrifolia avec des espèces voisines. C'est ainsi que le no: 51 de M. Morong, attribué au V. peruviana et provenant de l'Assomption, n'appartient nullement à cette espèce, mais bien au V. megapotamica var. truncatula. Le Verbena peruviana est basé sur une plante de l'Uruguay et de l'Argentine, figurée par Feuillée (Journ. observ. phys. etc. III, 25, fig. 3, ann. 1725), qui manque à la flore du Paraguay."

In my opinion, the Morong 51 mentioned above is typical V. incisa Hook.; I also see no specific difference in the V. peruviana of Britton and that of Kuntze. Osten, in a memorandum dated at Montevideo in January, 1931, says: "Ein weiteren grober Irrthum Briquet's betrifft V. teucrioides Gill. für welche Art er den zweifelhaften Namen Sprengels 'platensis' nimmt, dem er violette Blüten zuschreibt. V. teucrioides Gill. kommt in Paraguay auscheinend nicht vor und die von Briquet's platensis Spr. genannte Pfl. is V. marrubioides Cham. Hassler schrieb mir sein Einverständniss damit.....V. teucrioides Gill. hat wohlriechende gelblichweisse-reinweisse Blüten, kommt nur auf steinigen Boden (Granit) vor und ist von mir häufig in Uruguay, Sierra Pampeanas (Süden v. Bras.) gesammelt worden, ebenso habe ich sie aus den (alten) centralen Gebirge Argentiniens (z.B. Cordoba) wahrend sie in die jüngeren Cordilleren noch nicht eingedrungen zu sein scheint. Es scheint mir ein Fehler zu sein, alte, kannte sich Langem gebrauchte Namen wir teucrioides durch vielleicht ältere aber nicht einmal sichere Namen zu vertauschen. Cf. Walpers Repert. IV p. 33 sub no. 90. 'platensis: species haec inter plantas Selowii relictas, qui eam misit, non reperta pro cive dubio habenda etc.'" According to Briquet, however, the original types of both names were preserved in Berlin and Geneva and were compared there by Kuntze and by Briquet, so there seems to be no doubt now about their conspecificity.

Walpers (1845) kept V. scordioides Cham. separate from V. teucrioides Gill. & Hook. and classified both in his Section Verbenaca, Subsection Inermes, Group Foliosae, Subgroup Macranthae, and Secondary Subgroup Melindres along with 9 other species. Standley (1938) applied the name V. teucrioides to the plants now more properly termed xV. hybrida Voss, saying "Verbena. Cultivated commonly in gardens as an ornamental plant. Native of southern South America. The common garden verbena, with flowers varying from white to pink, red, or purple, is a favorite garden flower of Central America, especially in the temperate regions. The proper specific name of the garden plants, which may be in part of hybrid origin, is somewhat uncertain." Similarly, the work reported on by Barton (1939) as having been done with V. platensis was actually done with xV. hybrida.

It should be noted here that the V. anaïs Hort., V. teucrioides var. anais Lem., V. teucrioides var. anaïs Lem., and V. teucrioides anais Lem. regarded by me in previous publications as synonyms of V. platensis, are actually to be placed in the synonymy of xV. hybrida Voss since Lemaire definitely states that they are based on interspecific hybridization. The names V. teucrioides auriculiflora Regel, V. teucrioides var. auriculiflora Regel, V. teucrioides hybrida Vilm., and V. teucrioides x venosa Hort. also refer to xV. hybrida, while V. teucrioides x chamaedryfolia Osten is xV. osteni Moldenke. The only definitely known and named natural hybrid involving V. platensis is with V. peruviana (L.) Britton and is xV. osteni. The Herter 750b specimen in the United States National Herbarium at Washington has flowers that appear to be rather small for V. platensis -- possibly xV. osteni is involved here. The Vilmorin illustration cited above does not look exactly right for V. platensis -- it may represent xV. hybrida instead.

I suspect that most, if not all, of the records of pinkish or slightly rosy corollas represent flowers that are fading due to age.

Specimens of V. platensis have been misidentified and distributed in herbaria under the names V. chamaedryfolia Juss., V. coccinea Hort., V. odorata Meyen, and V. peruviana (L.) Britton. On the other hand, the Calderón 646 and Herb. Hort. Bot. Basil. s.n. [Aug. 1841] distributed as V. platensis are actually xV. hybrida Voss; Archer 4666 and Jörgensen 3772 are V. incisa Hook.; and Hassler 1105 is V. kuntzeana Moldenke.

Schauer (1847) cites a Sellow s.n. from "in campis Brasiliae meridionalis" and an Arsène Isabelle s.n. from Montevideo; Augusto (1946) also cites Isabelle s.n. from Montevideo, while Troncoso (1937) cites her no. 386 from Buenos Aires. Previous records of this species from Paraguay by me in various of my publications were based on Hassler 11052, which is now regarded by be as being V. kuntzeana Moldenke.

In all, 116 herbarium specimens and 16 mounted illustrations, including type or phototype material of most of the names involved, have been examined by me.

Citations: CUBA: Havana: Van Hermann 876 (N). BRAZIL: State undetermined: Sellow s.n. [Brasilia; Macbride photos 34356] (Bm, Br, F--photo, Kr--photo, N--photo, N--photo, Si--photo, Z--photo). URUGUAY: J. Anderson 131 (Bm); Arechavaleta 25 (Ug); Berro 72 (N), 5521 (N), 6719 (N); Cabrera 3852 (N); Castellanos s.n. [Nov. 1, 1946; Herb. Inst. Miguel Lillo 15776] (N, N); Collector undesignated s.n. [Maldonado, March 10, 1885] (Ug), s.n. (Ug); Gallinal, Aragone, Bergalli, Campal, & Rosengurtt B.810 (Ug--8772, W--1858123); PE.5056 (N,S, Ug--7097, Ug--10997, W--1904089); Herb. Mus. Hist. Nat. Montevid. s.n. [Pan de Azucar, Feb. 1909] (Ug); Herter 750 [Herb. Herter 82668] (B), 750a [Herb. Herter 85298; Herb. Osten 22635] (Ca--407186, N, S, Ug, W--1444423), 750b [Herb. Herter 85476] (Ca--453205, N, W--1934633), 750c [Herb. Herter 91079] (N), 750d [Herb. Herter 50367] (B), s.n. [Estancia Santa Clara, Sept. 29, 1926; Herb. Osten 19119] (S, Ug), s.n. [Santa Clara, Oct. 2, 1926; Herb. Osten 19188] (Ug); Legrand 1116 (Ug), 1567 (Ug), 2265 (Ug), 4508 (N, Ug); Montoro Guarch 579 (N), 2903 (N); Née 78 (Q), 93 (Q); Osten 2876 (Ug, Ug), 3177, in part (Ug), 3195, in part (F--photo, N--photo, Sg--photo, Ug, Z--photo), 11594 (S, Ug), 20080 (Ug, Ug); Rosa-Mato 566 (Ug--9814); Rosengurtt B.810 (Ca--79856, N), B.2133 (N), B.2882 (N), B.3010 (N), B.4577 (N); Schröder s.n. [Piedras de Afilar; Herb. Osten 19455] (Ug); Sellow s.n. [Montevideo; Macbride photos 17452] (Kr--photo of type, N--photo of type, N--photo of type); Teisseire s.n. [Estac. Moreno, 1913] (Ug--4476). ARGENTINA: Buenos Aires: Boffa 18 (N, N, S); Bruch 4091 (N); Cabrera 5166 (N), 6570 (N); Dusén 6281 (S); Eyerdam, Beetle, & Grondona 23419 (Ca--627492); Hauman s.n. [Sierra de Tandil, XII.1905] (Br), s.n. [Sierra de la Ventana, I. 1924] (Ur); Hauthal 63 (N); Herb. Bot. Mus. Lund. s.n. [Rio de la Plata] (Lu); Krapovickas 2924 (N); Kuntze s.n. [Tandil, Nov. 1892] (N); Kyle s.n. [Enero 1892] (Bm); Osten 2637 (Ug); Parodi 13864 (N); Reutzell 1101 (Ca--3312); Ruiz Huidobro 1175 (S), 1281 (S), 1575 (S). Catamarca: Jürgensen 1297 [Herb. Osten 11350] (Ug, W--1121006). Córdoba: Hieronymus s.n. [10.XI.1881] (N); A. T. Hunziker 7033 (N), 7205 (N); Lossen 117 (Ba, Um--48); A. G. Schulz 5991 (Sz); Sparre 1376 (S); E. Wall s.n. [La Falda, 15/12/46] (Ew); Wall & Sparre s.n. [La Falda, 15/12/46] (Ew). Corrientes: Bonpland 409 (N, N, W--2343495, W--2343497), s.n. [Corrientes] (N). Salta: Parodi 13467 (N); Schreiter 6620 [Herb. Inst. Miguel Lillo 32820] (N, N); A. G. Schulz 2892 (N). San Luis: Varela 651 (Ca). Tucumán: Monetti 1943 [Herb. Inst. Miguel Lillo 31338] (Vi). State undetermined: Friedman s.n. [1923] (Ba); Kurtz 6780 [Guasapampa] (N). CULTIVATED: Belgium: M. Martens s.n. [h. b.

lov. 1839] (Br), s.n. [Hort. Cels.] (Br). Ecuador: Firmin 307 (N, W--1420001). El Salvador: P. C. Standley 23652 (W--1139336). Germany: Herb. Prager 18640 (Gg--31459). Massachusetts: L. H. Bailey s.n. [Feb. 1884] (Ba). New York: T. H. Everett s.n. [N. Y. Bot. Gard. Cult. Pl. 97/46] (N); H. N. Moldenke 18652 (N). Uruguay: Moldenke & Moldenke 19939 (N). MOUNTED ILLUSTRATIONS: Paxt., Mag. Bot. 5: 243. 1838 (N), 244. 1838 (N); Vilm., Alb. de Cliches, ed. 2, fig. 25685 (N).

VERBENA PLATENSIS var. STENODES Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1056. 1904.

Synonymy: Verbena chamaedryfolia f. strigosa Chod., Bull. Herb. Boiss., sér. 2, 2: 818. 1902.

Bibliography: Chod., Bull. Herb. Boiss., sér. 2, 2: 818. 1902; Chod., Plant. Hassler. 9: 197. 1902; Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1055—1056. 1904; Briq. in Chod. & Hassler, Plant. Hassler. 10: 477—478. 1904; Moldenke, Suppl. List Invalid Names 8. 1941; Moldenke, Alph. List Invalid Names 46. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 44 & 102. 1942; Moldenke, Alph. List Cit. 1: 16 & 96 (1946), 2: 369, 374, 381, 442, 458, 535, & 600 (1948), 3: 660, 733, & 746 (1949), and 4: 1090, 1091, 1093, & 1302. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 106 & 199. 1949; Moldenke, Phytologia 3: 290 & 378. 1950; Moldenke, Résumé 128, 362, & 473. 1959; Moldenke, Résumé Suppl. 6: 7 (1963) and 7: 5 & 6. 1963.

This variety differs from the typical form of the species in having much narrower leaf-blades, oblanceolate-cuneate, subcoriaceous, rugose on both surfaces, the venation more robust beneath, and the stems subsimple. It is described as a creeping herb, with fragrant flowers, the corollas white or blue to yellow, the tube pale-pink on the outside.

The type of this variety was collected by Emil Hassler (no. 5758) on the campo near Caraguatay, Paraguay, in December, and is deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques in Geneva. Chodat says of it "foliis oblanceolato-cuneata subtus robustius nervosus, subtus et supra rugosis subcoriaceis, caulibus subsimplicibus. Suffrutex 0,3--0,4, petala coerulea". Briquet says of it "Planta 30--40 cm. alta. Folia sessilia, infima tantum subsessilia, angustius oblongo-elliptica, superficie ad 3,5 x 0,8 cm. regulariter crenato-dentata, dentium culminibus 1--1,5 mm. altis et 2--3 mm. distantibus. Spicae (an constanter?) brevius pedunculatae. Suffrutex 0,3--0,4 m. alta, petala coerulea."

The variety has been found by collectors on hillsides, among debris on mountain slopes, in dry river valleys and among rocks in dry riverbeds, in dry fields and dry open campos, at altitudes of 700 to 1800 meters, flowering in August and from October to January. The Herb. Osten 11350 specimen cited below bears a note to the effect that "the habit of the mountain plant is different from that of the plains, namely the leaves are narrower -- probably 2 vars. or subvars."

Material of this variety has been misidentified and distributed in herbaria under the names V. platensis Spreng., V. teucrioides Gill., and V. teucrioides Hook., and as "V. teucrioides var. fol. elongato-lanceolatis" by Osten.

In all, 44 herbarium specimens and 2 mounted photographs have been examined by me.

Citations: ARGENTINA: Buenos Aires: Mansel s.n. [Bahia Blanca, 1884] (Bm); Sparre 370 (S). Catamarca: Jörgensen 1297 (Ca--205333), s.n. [Andalgalá, Dec. 1916; Herb. Fac. Cienc. Med. Buenos Aires 1297] (N--photo, Sp--25784, Z--photo), s.n. [El Suncho, Dec. 26, 1916; Herb. Osten 11350] (S); Rodriguez Vaquero 899 (N). Córdoba: Castellanos s.n. [Valle de los Reartes, 15.XII.1920; Herb. Osten 15288] (Ug); F. A. Roig 1046 [Herb. Ruiz Leal 17828] (Sm). Corrientes: Bonpland s.n. [Corrientes] (W--1705992). Jujuy: Burkart & Troncoso 11003 (N). La Rioja: Castellanos s.n. [Herb. Mus. Argent. Cienc. Nat. 33891] (N). Salta: R. E. Fries 615 (S); Garolera & Romero s.n. [La Silleta, 16-I-1947] (Gg--353218, N); T. Meyer 3451 [Herb. Inst. Miguel Lillo 35567] (En, N), 3456 [Herb. Inst. Miguel Lillo 35572] (En, N); Moldenke & Moldenke 19736 (N); O'Donell 4933 (N); Ruiz Leal 14186 (Rl); Schreiter 5079 [Herb. Osten 20020] (Ug, W--1591455), 6620 [Herb. Inst. Miguel Lillo 32820] (Ug--4946), 9476 [Herb. Osten 22901] (Ug); A. G. Schulz 6581 (Z); Sparre 1201 (S); Venturi 5143 (S, W--1591463), 7976 [Herb. Osten 20884] (Du--372483, Gg--166628, Ug, W--1443314, W--1591397); Wall & Sparre s.n. [nw. of Salta, 4/12/46] (Ew, Ew, Ew, Ew, Ew). Tucumán: Bailetti 167 [Herb. Inst. Miguel Lillo 31347] (N); Lillo 2899 [Herb. Inst. Miguel Lillo 31340; Herb. Osten 8459] (N, Ug); Monetti 1943 [Herb. Inst. Miguel Lillo 31338] (N); Venturi 2408 (W--1591254).

VERBENA PLATENSIS f. VIOLACEA Moldenke, Phytologia 3: 177. 1949.

Bibliography: Moldenke, Phytologia 3: 177. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 100 & 199. 1949; Moldenke, Résumé 120 & 473. 1959.

This form differs from the typical form of the species in having its corollas always violet or rose-purple in color.

The type of the form was collected by Cornelio Osten (no. 3195, in part) at Arroyo Grande, Tala, in the department of Soriano, Uruguay, on October 3, 1895, and is deposited in the Osten Herbarium at the Museo de Historia Natural in Montevideo. The specimen was originally annotated by Osten as "V. teucrioides Gill. forma flor. violascentibus". It is mounted on a sheet with a branch of the typical white-flowered form from the same locality. Osten reports that the form was growing along with "V. erinoides", but is not a hybrid with it. With this assertion I agree.

Herter found the form on a stony campo at Santa Clara, at 200 meters altitude, and describes the flowers as rose-purple (xenochromia) and fragrant.

In all, 2 herbarium specimens, including the type, and 4 mounted photographs have been examined by me.

Citations: URUGUAY: Herter s.n. [Herb. Osten 19188] (Ug); Osten 3195, in part (F--photo of type, N--photo of type, Sg--photo of type, Ug--type, Z--photo of type).

VERBENA PLICATA Greene, Pittonia 5: 135. 1903.

Synonymy: Verbena plivata Greene ex Moldenke, Alph. List Cit. 2: 630, sphalm. 1948. Verbena cinerea H.B.K. ex Moldenke, Résumé 362, in syn. 1959.

Bibliography: Greene, Pittonia 5: 135. 1903; Prain, Ind. Kew. Suppl. 3: 187. 1908; Perry, Ann. Mo. Bot. Gard. 20: 248, 261, 294—296, 302, & 356. 1933; Steyerm. & Moore, Ann. Mo. Bot. Gard. 20: 805. 1933; Cory, Texas Agr. Exp. Sta. Bull. 550: 89. 1937; Sperry, Sul Ross State Teach. Coll. Bull. 22: 41. 1941; Moldenke in Lundell, Fl. Texas 3 (1): 16, 17, & 28--29. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 13—15, 19, & 102. 1942; Moldenke, Castanea 10: 40. 1945; Moldenke, Alph. List Cit. 1: 13, 14, 42, 51, 125, 127, 130, 175, 176, 200, 253, 258, & 268. 1946; Moldenke, Phytologia 2: 164 (1946) and 2: 328 & 329. 1947; Moldenke, Wrightia 1: 226--227. 1948; Moldenke, Alph. List Cit. 2: 400, 457, 472--475, 480, 496, 519, 526, 527, 594, 596—598, & 630 (1948), 3: 674, 678, 679, 681--683, 698, 717, 729, 789, 790, 796, 797, 806, 824, 829, 831, 832, 850, 873, 882, 886, 915, 936, 965, & 966 (1949), and 4: 989, 991—993, 996, 998, 1003, 1004, 1098, 1099, 1107--1110, 1122, 1137--1139, 1150, 1151, 1163, 1174, 1183, 1187, 1212, 1213, 1220, 1228, 1230, 1236, 1239, & 1294. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 24—26, 33, & 199. 1949; Moldenke, Phytologia 3: 132. 1949; Waterfall, Rhodora 52: 20 & 38. 1950; Shinners, Spring Fl. Dallas 326. 1958; Moldenke, Résumé 26, 29, 31, 32, 39, 362, & 473. 1959; Moldenke, Résumé Suppl. 2: 3, 4, & 12. 1960; Jones, Rowell, & Johnston, Flow. Pl. & Ferns Tex. Coast. Bend 144. 1961; Irwin, Roadside Flow. Tex. 190. 1961; Lewis & Oliver, Am. Journ. Bot. 48: 639—641, fig. 20. 1961; Moldenke, Phytologia 8: 124 (1961) and 8: 279. 1962; Moldenke, Résumé Suppl. 3: 7 & 10 (1962), 5: 4 (1962), 6: 3 & 4 (1963), and 7: 3. 1963; Moldenke, Phytologia 8: 471, 473, & 477 (1963) and 9: 34, 36, 156, 165, & 199. 1963; Moldenke, Résumé Suppl. 8: 1 (1964) and 10: 2. 1964; Moldenke in Shreve & Wiggins, Veg. & Fl. Son. Des. 2: 1241. 1964; Moldebke, Phytologia 10: 182 & 285. 1964.

Illustrations: Lewis & Oliver, Am. Journ. Bot. 48: 640, fig. 20. 1961.

Coarse, low, annual or perennial, erect herb, branched at the base; roots fibrous; stems decumbent or ascending, branched, hirtellous; branches erect or ascending, to 2 dm. long, spreading; leaves decussate-opposite; petioles winged; lower leaf-blades oblong-spatulate or elliptic-ovate, 1—4 cm. long, narrowed at the base into a margined petiole of about the same length, broadly obtuse at the apex, plicate, coarsely incised or incised-dentate, often 3-lobed, more or less canescent, rugose and somewhat appressed-hirsute above, hirsute beneath and prominently marked (particularly near the margins) with whitish veins, the upper ones similar but smaller, often appearing spatulate; spikes terminal on the stems and branches, ordinarily not compact; bractlets green, herbaceous, ovate-lanceolate, usually surpassing the calyx, at times barely equaling it, 5--7 mm. long, 1.5--4 mm. wide, gradually attenuate from the base to the apex, acute at the apex, hirsute, the midrib often noticeable; calyx 3.5--4 mm. long, more or less glandular-hirsute, its lobes very obtuse or subtruncate, terminating abruptly in subulate teeth; corolla varying from blue, bluish-lavender, light bluish-lavender, bluish, bluish-violet, or dark-blue to blue-purple, purplish-blue, purplish-violet, purplish, purple, lavender, pink-lavender, or magenta, its tube scarcely longer than the calyx, its limb 4--6 mm. wide, the anterior lobe retuse; cocci cylindric-trigonous, 2--2.5 mm. long, shallowly scrobiculate above, changing to indefinitely striate toward the base, the commissural faces finely muricate-scabrous to practically smooth, not reaching the tip of the coccus; chromosome number: $n = 7$.

The type of this species was collected by Samuel Mills Tracy and Franklin Sumner Earle (no. 30) at Barstow, Ward County, Texas, on April 14, 1902. The specimen on which *V. cinerea* is based seems to be J. Reverchon s.n., collected on August 9, 1877, in Comanche County, Texas, and is deposited in the herbarium of Barnard College at the New York Botanical Garden. It seems certain that this is an error in transcription for *V. canescens* H.B.K.

In Texas *V. plicata* is said to occur chiefly in open sandy ground, flats, prairies, and ravines, and along roadsides, frequent on gravel hills, widespread in northern, central, and southern portions of the state from Childress and Young to Gonzalez and Cameron, west to Zapata, Brewster, and Jeff Davis Counties. Collectors have found it in stony or rocky soil, in sandy or dry sandy soil, limestone or fairly well-packed reddish sandy soil, igneous or dry clay-loam soil, in sand or brickred-colored loose sand, coarse sand and sandy loam, sandy red soil, red sand over gypsum, red Permian shale, interfan alluvium, fine sandy loam or brownish sandy-loam soil, orange-colored sandy loam or light-gray calcareous soil, gravelly calcareous soil of the type known as Reeves Gravelly Loam, sandy loam soil over caliche, clay or black clay soil, loam, wet sand, or sandy loam, and hardpan soil. It grows in deposits of deep sand at the edge of woods, in mesquite grasslands, ungrazed pastures, mixed prairie grasslands, in dry or open sandy ground, dry calcareous open ground, and open or dry open ground in general, in brushlands, clearings in brush, thick brush, pastures, oak areas, depressions, and wet ravines. It occurs on cliffs and gypsum bluffs, road shoulders, plains and brushy or high rocky plains, sand dunes, banks, rough, rocky, or dry rocky hillsides, sandy ridges among large yuccas, *Prosopis-Condalia* flats, open hillsides and flats, and on the sandy bottoms of floodplains. One is apt to encounter it among brush on sandstone ridges, along rivers and roadsides, and near irrigation ditches, at altitudes of 30 to 5400 feet, flowering and fruiting from February to October.

Benson states that V. plicata is a component of the Desert Grassland vegetation type in Arizona. Waterfall reports it from "gravelly soil in Larrea-Prosopis-Gutierrezia association" in Reeves County, Texas, and in "silty soil in valley between gypsum ridges" in Oklahoma. Cory reports it as "frequent on roadsides" in Ward County. Brown calls it a "rare perennial in pasture" in Brewster County, while Hanson avers that it is "frequent on rocky slopes" in that county. Scudday asserts that it is found "throughout" Andrews County in low places, Pammel says that it is "common on prairies" in Starr County, while Muller asserts it to be "common on red sandy prairies" in Frio County.

According to Runyon, it is "abundant in the Beeville region" of Bee County, Texas, and "frequent in Hidalgo and Starr Counties on the gravel hills"; he also states "flowers in terminal racemes, rare in the region near Brownsville, prefers sandy soil". Actually, of course, the flowers are in spikes, not racemes. Warnock refers to the species as "infrequent in red igneous soil" in Brewster County and "infrequent to frequent perennial herb in limestone soil" in Crane County; he and McBryde refer to it as a "frequent perennial" in Crockett County. In Burnet County it was found by Lathrop in sandy soil of a rocky gully in granite outcrops on the slopes with Juniperus, Yucca, and Opuntia. According to Johnston, it is a "frequent annual" or "infrequent in dry sandy loam associated with V. bipinnatifida, Sorghum halepense, and Triodia albescens" in Webb County, while Warnock & Mullins refer to it as "infrequent" in Crane County. Jones, Rowell, & Johnston (1961) say that it grows in pasture openings on well-drained sandy or clayey loams and caliche, flowering in spring and summer. In Shreve & Wiggins (1964) it is stated that V. plicata grows "In open sandy ground, flats, prairies, and ravines, along roadsides, and frequent on slopes of gravel hills and cliffs, Lower and Upper Sonoran Zones, from the vicinity of Tucson, Arizona, to Texas and Nuevo León."

Specimens of V. plicata have been misidentified and distributed in herbaria under the names V. bipinnatifida Nutt., V. bracteata Lag. & Rodr., V. bracteosa var. brevibracteata Gray, V. canescens Kunth, V. canescens H.B.K., V. canescens var. roemeriana (Scheele) Perry, V. caroliniensis (Walt.) J. F. Gmel., V. cauesceus var. roemeriaua (Scheele) Perry, V. cloveri Moldenke, V. cloveri var. lilacina Moldenke, V. gracilis Desf., V. halei Small, V. neomexicana Small, V. neo mexicana (Gray) Small, V. neo-mexicana (A. Gray) Small, V. neomexicana var. hirtella Perry, V. perennis Wooton, V. plicata var. degeneri Moldenke, V. polystachys H.B.K., and V. xutha Lehm. As an example of the confusion attending this species in herbaria, Croft s.n. [San Diego, 1885] was determined, in sequence, as V. canescens H.B.K., V.

canescens var. neo-mexicana A. Gray, V. neomexicana (A. Gray) Small, V. neo-mexicana Briq., V. remota Benth., and V. remota var. hirsuta (Torr.) Farwell!

On the other hand, the Tharp 43-800, 43-801, 43-802, & 43-893b, distributed as V. plicata, are actually var. degeneri Moldenke; Waterfall 15325 is V. canescens H.B.K.; S. E. Wolff 539 is V. canescens var. roemeriana (Scheele) Perry; L. C. Taylor 3033 is V. halei Small; Waterfall 5143 and Waterfall & Wallis 13342 are V. neomexicana var. hirtella Perry; and Parks & Cory 14747 is Heliotropium sp. in the Heliotropiaceae. Arsène 18885 is a mixture with V. bracteata Lag. & Rodr.; J. Reverchon 737 and B. H. Warnock s.n. [May 3, 1937] are mixtures with V. canescens var. roemeriana; Tharp 43-800 is a mixture with V. canescens var. roemeriana and with V. plicata var. degeneri; Wagner & Barkley 16T322 is a mixture with V. halei Small; and B. H. Warnock 20436 and Wiggins 4360 are mixtures with V. neomexicana var. hirtella Perry.

The Bogusch s.n. [Spring 1926], cited below from Bexar County, Texas, may actually have been collected in Wilson County -- both county names appear on the label; Ecology Class Univ. Texas s.n. [2.28.30] and s.n. [2.29.30], cited below under Webb County, may have come from Zapata County — the labels are inscribed "Laredo—Zapata". The record of V. plicata from Yavapai County, Arizona, appearing in some of my previous publications, was based on some specimens of Toumey 306, but according to the best available information this collection was actually made at Tucson, in Pima County, on May 2, 1892. E. W. Lathrop 2075 is a mixture with V. canescens var. roemeriana.

Perry (1933) cites the following 43 additional specimens not as yet seen by me: TEXAS: Blanco Co.: E. J. Palmer 13282 (E). Brewster Co.: H. C. Hanson 619 (E); Moore & Steyermark 3299 (E); E. J. Palmer 30523 (E). Comanche Co.: Eggert s.n. [near Comanche, 10 May 1900] (E, G); J. Reverchon 834, in part (E). Hall Co.: J. Reverchon 4314 (E). Hidalgo Co.: McKelvey 1756 (G). Jeff Davis Co.: Ferris & Duncan 2726 (E). Martin Co.: Eggert s.n. [north of Stanton, 13 June 1900] (E). Mitchell Co.: Eggert s.n. [north of Colorado, June 1900] (E, G). Nolan Co.: E. J. Palmer 13730 (E). Nueces Co.: Edw. Palmer 2038 (G). Terrell Co.: E. J. Palmer 33537 (E). Tom Green Co.: J. Reverchon 1953 (E). Travis Co.: E. Hall 429 (F, G). Val Verde Co.: Orcutt 6235 (E). Ward Co.: Tracy & Earle 30 (E—isotype, F--isotype, G—isotype). Webb Co.: Berlandier 1485 [225], in part (G); Orcutt 5555 (E), 5717 (E); Edw. Palmer 2040 (G); J. Reverchon 3904 (E, G). County undetermined: Berlandier 644 (E), 2506, in part (E); J. Reverchon 118 (G); C. Wright 1496 (E, G). NEW MEXICO: Dona Ana Co.: Fendler 594 (E, G). ARIZONA: Cochise Co.: Pringle s.n. [Camp Lowell, June 8, 1882] (D, F). Pima Co.: Bartram 256 (D); Greenman &

Greenman 28 (E); Pringle s.n. [near Pantano, June 14, 1881] (E, F, G). She says: "In habit V. plicata is somewhat similar to V. neomexicana, but in inflorescence it strongly resembles V. canescens var. roemeriana. Its distinctive character is foliar and is most easily seen in the basal and lower stem-leaves. The leaf is obviously petioled, often 3-lobed, and very shallowly incised-dentate; moreover, the veins beneath are whitish and particularly prominent near the margin owing to the plication of the leaf and the apparent broadening of the veins in this region." The C. Wright 1496 collection which she cites from Texas, is cited by me below as from New Mexico, as is stated on the label. It may well be, however, that what Wright regarded as part of Texas is now New Mexico, or vice versa.

In all, 343 herbarium specimens, including the type material of all the names involved, and 2 mounted photographs have been examined by me.

Citations: OKLAHOMA: Cimarron Co.: C. M. Rogers 5990 (Au—122466, Ok, W—2053132); Waterfall 8663 (Ok, St). Harmon Co.: Waterfall 8347 (Ok), 8979 (Ok). Jackson Co.: W. S. Myers 751 (Ok); Waterfall 9437 (St, St), 11980 (Au—122465, Go, Ok, St, W—2231137). TEXAS: Andrews Co.: Lundell & Lundell 11406 (Rf, Sm); Scudday s.n. [5/4/59] (Ld). Archer Co.: Vollum s.n. [Fort Belknap, 1855] (W—56211). Atascosa Co.: E. J. Palmer 9767 (Bi, Du—205612, S, W—1531981). Baylor Co.: Bridge s.n. [near Seymour, 6/16] (Cn). Bee Co.: R. Runyon 2188 (Rr); Wolcott & Barkley 16T420 (Au). Bexar Co.: Bogusch s.n. [Bexar & Wilson Counties, Spring 1926] (Ob—86215); Metz 557 (I), 2156 (Se—57943), 2478 (S). Blanco Co.: E. J. Palmer 13282 (B, W—1603459). Brewster Co.: G. W. Brown B.102 (N); Cory 43929 (Au); H. C. Hanson 619 (N, W—982949); A. R. Moldenke 169 (Fg); Moore & Steyermark 3299 (Ca—471365); Parks & Cory 9146 (Tr), 9296 (Tr), 9297 (Tr); Rose-Innes & Moon 1169 (Au); Steiger 583 (N), 2038 (N); Tharp 253 (N); B. H. Warnock 4600/5644 (Au—122421), 20436, in part (Au), 20437 (Au), 21230 (Au), s.n. [May 3, 1937] (Au). Brooks Co.: C. L. Lundell 10819 (N, Rf), 10827 (N, Rf); Parks & Cory 14209 (Tr). Brown Co.: J. Reverchon 737, in part (W). Burnet Co.: E. W. Lathrop 2075, in part (Lw). Cameron Co.: C. L. Lundell 10702, in part (Sm), 10779 (Sm); R. Runyon 2463 (N, N, N, N). Childress Co.: Biology Class Childress High School 19 (Au). Coke Co.: Parks & Cory 12889 (Tr—16188), 13891 (Tr—16179). Comanche Co.: J. Reverchon s.n. [Aug. 9, 1877] (Bc). Crane Co.: Lundell & Lundell 10232 (Ld, N); B. H. Warnock 14656 (Au—123220, Rf); Warnock & Mullins 14405 (Au—198214, Rf). Crockett Co.: M. E. Jones 26221 (Po—178340); Warnock & McBryde 15316 (Au—123207, Rf). Crosby Co.: J. D. Graham s.n. [June 11, 1960] (Au—181482). Culberson Co.: Waterfall 4171 (N, Ok, St), 5172 (Au, Gg—316102, N, Ok). Dawson Co.: Herb. Texas Soil Survey s.n. [6-25-1922] (Tr). Dickens Co.: Cory 13618 (Md); Parks & Cory 13618 (Tr—16186). Dimmit Co.: D. S. Correll 20736 (Rf); Johnston, Tharp, & Turner 3534 (Au—122438). Duval Co.: Croft 79 (C, Pa), s.n. [San Diego, 1885] (Mi). Ector Co.: Lundell & Lundell 11403 (N, Rf); Tharp s.n. [7/10/41] (Au). Fisher Co.: Booker 29 (Au, Au), s.n. [Rotan] (Au); T. M. Shepherd s.n. [Ray's pasture, Grady, Apr. 7, 1901] (W—413926). Frio Co.: R. Bebb s.n. [Dilley, Apr. 28, 1905] (Ok); Cory 12755 (Md); Ecology Class Univ. Texas s.n. [Dilley, 2.27.30] (Au); Lucas, Painter, & Barkley 14227 (Au, Ok, S); C. L. Lundell 13620 (Sm); C. H. Muller 2612 (Ca—719584, Rf); Tharp s.n. [Dilley, 2-27-30] (Ca—882790). Garza Co.: F. W. Pennell 10528 (N); Ruth 1289 (Au—122439, Mi, W—1243556), 1421 (Mg—65, W—1287488); Wooton s.n. [Post, May 22, 1925] (W—1244639). Hardeman Co.: C. R. Ball 1171 (W—501646). Hidalgo Co.: Lundell & Lundell 9820 (Ld, N), 10038 (Ld, N, W—1888884), 10069 (Ld, N); McKelvey 1756 (W—1581391); Tharp & York 51-259 (Au—122450, St); B. L. Turner 4495 (Au—168768); Mrs. E. J. Walker s.n. [2/9/42] (Au, Au). Howard Co.: Parks & Cory 12888 (Tr—16180). Hudspeth Co.: Tharp 43-804 (Au, Ca—882666); Waterfall 5348 (N). Jeff Davis Co.: C. C. Albers 46259 (Au, N); Ferris & Duncan 2726 (Ba, Du—125421, Gg—31272, N, Po—126881); Parks & Cory 18456 (Tr—16183); B. H. Warnock 4800/5671 (Au—122420); M. S. Young s.n. [Davis Mtns., 9/5/18] (Po—161332). Jim Hogg Co.: M. C. Johnston 54118 (Au—122433); Tharp & Johnston 542036 (Au—122411); Tharp, Johnson, & Webster 48-70 (N). Jim Wells Co.: F. B. Jones 2982 (Ww); E. J. Palmer 11257 (Au—122434, Ca—425607); Wagner & Barkley 16T322, in part (Au, N). Jones Co.: N. C. Henderson 63-141 (Au—217614). Kendall Co.: Metz 170 (I). Kent Co.: Correll & Johnston 22106 (Ld). Kerr Co.: F. W. Pennell 10387 (N). Kleberg Co.: E. R. Bogusch S.62 (W—2003648); S. F. Sinclair s.n. [Kingsville, Spring 1940] (Au); S. M. Tracy s.n. [Kingsville, 4/10/05] (Tr). LaSalle Co.: Winch 6 (Ok). Live Oak Co.: E. D. Schulz s.n. [4/22/1938] (Wi). Llano Co.: Wolff 3908 (Tr—16163). Lubbock Co.: Demaree 7539 (Du—205667, W—1469003); Tharp s.n. [Yellow Hand Canyon, 5/1/34] (Au, Au). Lynn Co.: Moldenke & Woods 599 (S), 600 (S). Midland Co.: Cory 42034 (Au); Lundell & Lundell 10260 (Ld, N); Parks & Cory 12480 (Tr—16181). Mitchell Co.: Cory 48041 (Au, N); C. L. Lundell 11375 (Rf); Lundell & Lundell 11375 (N); R. W. Pohl 4360 (Sm), 4723 (Sm), 4845 (Sm), 5105 (Sm). Nolan Co.: E. J. Palmer 13730 (B, W—1603581). Pecos Co.: Lundell & Lundell 10197 (Ld, N), 10204 (Ld, N, W—1888893); B. H. Warnock 47 (W—1730931), 46122 (Au, N, Ok). Presidio Co.: C. L. York 48164 (St). Reeves Co.: Correll & Johnston 22034 (Ld); A. R.

Figure 13. Distribution of *Verbena plicata* in the United States

Herbarium curators who have material of this species from additional counties are asked to send it to the author for verification and record, so that future editions of this map may be more complete

Mapping by counties done by Andrew R. Moldenke

Moldenke 643 (S); Parks & Cory 18457 (Tr--16184); Roane 30 (Ar--256370); Waterfall 4231 (St, Tu--128475). Runnels Co.: J. C. Johnson 663 (Au--122452). San Patricio Co.: F. B. Jones 1810 (Ww). Shackelford Co.: Rohrbaugh 473 (Z). Starr Co.: Alvarez, Guajardo, Salazar, & McCart 7923 (Ok); Lundell & Lundell 9788 (Ld, N); McCart 7227 (Ok); C. L. Pammel s.n. [Rio Grande City, 2-28-29] (Io--134124); R. Runyon 2560 (N); Tharp & York 51-134 (Au-122431, St). Sterling Co.: R. W. Pohl 4790 (Sm). Stonewall Co.: V. L. Harms 1752 (Lw). Taylor Co.: J. F. Brenckle 48079 (N); Mahler 1353 (St); Tolstead 7103 [Herb. Tex. Agr. Exp. Sta. 41986] (Au), 7200 (N). Terrell Co.: E. J. Palmer 33537 (N), 33567 (N); Warnock & Turner 600 (Rf). Tom Green Co.: E. J. Palmer 12382 (Ca--425603), 12383 (Au--122423); C. Smith 143x (Ok). Travis Co.: Armer 5380 (Au, Au, Au, Au, W--1438994); E. Hall 429 (N, Pa, W); Tharp s.n. [Austin, 5-16-39] (Gg--316100, Mi). Uvalde Co.: C. L. Lundell 10966 (Sm). Upton Co.: Cory 53475 (N); Lundell & Lundell 10223 (Ld, N, W--1888902). Val Verde Co.: Cory 39090 (N, N); G. L. Fisher 282 (W--1119184). Ward Co.: Cory 51970 (N, W--1946393); Earle & Tracy 41 (N); Lundell & Lundell 11381 (Ld, Sm); E. L. Reed 1922 (W--1488976); Tracy & Earle 30 (Au--isotype, Cm--isotype, Es--isotype, N--isotype, N--isotype, N--photo of isotype, Tr--8125--isotype, W--441779--isotype, Z--photo of isotype). Webb Co.: Acle & Guerrero 158 (Ok); J. Baird s.n. [Laredo, June 11, 1960] (Au--181924); Blair & al. 48-487 (Au--122455); Cantu, Chapa, & McCart 18 (Ok); M. E. Drake 32 (Ok, Ok); Ecology Class Univ. Texas s.n. [Laredo--Zapata, 2.28.30] (Au, Au), s.n. [2.29.30] (Au); H. J. Hamby 545 (Ar--206671); M. C. Johnston 3801 (Au--169773); Lewis & Oliver 5411 (Nb); Lundell & Lundell 10106 (Ld, N); K. K. Mackenzie 95 (Dt, N); McCart 7163 (Ok), 7288 (Ok); J. Reverchon 3904 (W--969776); Tharp s.n. [3-15-31] (N). Wilbarger Co.: Whitehouse 10931 (Sm). Willacy Co.: Lewis & Oliver 5423 (Nb). Winkler Co.: Lundell & Lundell 11393 (N, Rf). Young Co.: B. B. Harris s.n. [5-2-31] (N), s.n. [5-10-31] (Nt); Hayes 608 (Du--177390, Ms, N); McCart 860 (Nt); Whitehouse 15341 (Mi, N). Zapata Co.: Cantu & McCart 36 (Ok); Cory 28133 (N); Herrera & McCart 7698 (Ok); Lundell & Lundell 10109 (Ld, N); McCart 7205 (Ok); Ramos, Sandoval, Salazar, & McCart 7847 (Ok); Tharp & Johnston 541936 (Au--122352). County undetermined: Berlandier 644 (T); Havard s.n. [Pecos River, Sept. 1881] (W--218870); "L. A." s.n. [4.2.29] (Au); E. L. Reed 3391 [Posey Canyon] (W--1184334); Winans s.n. [Central Texas, 5-27 & 28-1932] (Mi, N); C. Wright 253 (Au--121974); M. S. Young s.n. [Colorado River banks near Sandy Creek, 4/22/15] (Au). NEW MEXICO: Eddy Co.: C. C. Albers 46289 (Au). Guadalupe Co.: A. R. Moldenke 127 (Fg). Hidalgo Co.: A. R. Moldenke 142 (Am); E. Ordway s.n. [Rodeo, August 6, 1955] (Am). Lincoln Co.: F. S. Earle 427 (W--480899), 606 (N); Earle & Earle 427 (N). Quay Co.: A. R. Moldenke 124 (Fg). San Miguel Co.: Arsène 18885, in part (Po--148523). County undetermined: W. B. Pease s.n. [New Mexico, 1878] (W--147570); C. Wright 1496 (Ca--248341, T). ARIZONA: Cochise Co.: Benson 11369 (Po--267650); Griffiths 1595 (N); Pringle 4829 (N), s.n. [Camp Lowell, June 8, 1882] (Al, Br, C, Cm), s.n. [valley near Camp Lowell, 1882] (Sg--68316). Pima Co.: Pringle s.n. [Santa Catalina Mts., April 13, 1881] (Ll), s.n. [near Pantano, June 14, 1881] (Pa, Up-17099, Vt); Smart 352 (W--56210); J. J. Thornber s.n. [July 21, 1901] (Tu), s.n. [May 11, 1903] (Tu); Toumey 306 (Du--90894, Tu, W--212335). MEXICO: Baja California: Wiggins 4360 (Du--259476, W--1739752). Chihuahua: M. E. Jones s.n. [Colonia Juarez, Sept. 11, 1903] (Po--71250). Coahuila: M. E. Jones 372 (Po, W--237975); E. G. Marsh 1133 (St); S. S. White 1994 (Mi). Nuevo León: Frye & Frye 2392 (Se--65713). Sonora: Wiggins 11783 (Du--346447, W--2264373). Tamaulipas: Lewis & Oliver 5412 (Nb). State undetermined: W. W. Jones s.n. [Agua Prieta, 4/17/44] (Or--52101).

VERBENA PLICATA var. DEGENERI Moldenke, Phytologia 2: 24--25.1941.

Bibliography: Moldenke, Phytologia 2: 24--25. 1941; Moldenke in Lundell, Fl. Texas 3 (1): 17 & 29. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 13 & 102. 1942; Moldenke, Phytologia 2: 164. 1946; Moldenke, Alph. List Cit. 1: 154. 1946; H. N. & A. L. Moldenke, Pl. Life 2: 55. 1948; Moldenke, Wrightia 1: 227. 1948; Moldenke, Alph. List Cit. 3: 795 & 914 (1949) and 4: 989. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 24 & 199. 1949; Moldenke, Résumé 29 & 473. 1959.

This variety differs from the typical form of the species in its bractlets being very firm and rigid, dry, stramineous, broadly ovate, to 9 mm. long and 6 mm. wide, and very abruptly acuminate at the apex.

The type of the variety was collected by my very good friend and colleague, Otto Degener (no. 5184) -- in whose honor it is named -- near Fort Stockton, Pecos County, Texas, on August 2, 1933, and is deposited in the Britton Herbarium at the New York Botanical Garden.

The variety has been found in dry desert land, mesa margins, valleys, mesquite valleys, Flourensia flats, and railroad rights-of-way, in two counties of western Texas, where it appears to be endemic, flowering and fruiting from June to August. It is not a very well marked variety and may prove to be merely an edaphic variant due to the rigorous environment in which it lives.

Material has been misidentified and distributed in herbaria under the names V. canescens H.B.K., V. cauesceus H.B.K., V. cauesceus var. roemeriaua (Scheele) Perry, V. neomexicana (A. Gray) Small, V. neo-mexicana (A. Gray) Small, and V. plicata Greene.

In all, 16 herbarium specimens, including the type, and one mounted clipping have been examined by me.

Citations: TEXAS: Brewster Co.: H. B. Parks 3096 (Wi); E. D. Schulz 2026 (N, Wi, Wi). Pecos Co.: O. Degener 5184 (N--type); Tharp 43-799 (Au), 43-800 (Au--122454, N), 43-801 (Au, Ca--882625, N, W--1888992), 43-802 (Au, N), 43-803 (Au), 43-893b (N). MOUNTED CLIPPINGS: Phytologia 2: 24--25. 1941 (W).

VERBENA POGOSTOMA Klotzsch ex Walp., Repert. 4: 31. 1845.

Synonymy: Verbena pogonostoma Klotzsch ex Schau. in A. DC., Prodr. 11: 550. 1847.

Bibliography: Walp., Repert. 4: 31. 1845; Schau. in A. DC., Prodr. 11: 550 & 553. 1847; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 148. 1894; Jacks., Ind. Kew. 2: 1179. 1895; Hayek in Engl., Bot. Jahrb. 42: 165. 1908; Hicken, Chlor. Plat. Argent. 198. 1910; Moldenke, Suppl. List Invalid Names 10. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 44, 74, & 102. 1942; Moldenke, Alph. List Invalid Names 49. 1942; Moldenke, Alph. List Cit. 1: 96 (1946) and 2: 359 & 442 (1948), and 3: 688. 1949; Moldenke, Phytologia 3: 136. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 106, 164, & 199. 1949; Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 6: 2209 & 2212. 1951; Moldenke, Résumé 128, 224, 372, & 473. 1959; Moldenke, Résumé Suppl. 3: 15. 1962; Moldenke, Phytologia 9: 15. 1963.

Perennial, perhaps suffrutescent at the base, diffuse, grayish-subcanescent throughout; branches hirtellous-pubescent; leaves sessile; leaf-blades about 4 cm. long, tripartite, cuneate at the base, strigose-hispidulous above and on the venation beneath, the segments narrow, pinnatifid-incised and dentate above, the laciniations linear-lanceolate, acute, revolute-margined, the lower ones entire and 2 mm. wide; spikes terminal and axillary, fastigiate, short-pedunculate, dense-flowered, strigose-hirtellous and glanduliferous, greatly elongate during anthesis, eventually becoming 15 cm. long, the flowers always imbricate; bractlets lanceolate-subulate, half as long as the calyx; calyx about 6 mm. long, about equaling the corolla-tube, colored, substrigose-pubescent with non-spreading hairs, the rim 5-fid, the teeth unequal, subulate-attenuate from a lanceolate base; corolla-tube infundibular, scarcely surpassing the calyx, gradually widened from the base to the yellow throat, barbate at the mouth, the limb medium in size, blue, the lobes short, rounded; fruit half as long as the fruiting-calyx, the cocci reticulate on the back.

This species was apparently based on several collections made from plants cultivated at the botanical garden in Berlin, Germany, and collected there in October, 1839, and August, 1843, and deposited in that herbarium, where they were photographed by Macbride as his type photograph 17440, but are now destroyed. Schauer, in 1847, states that he saw plants of this species still growing in that garden. Macbride's photograph of the Berlin cotypes is inscribed "Peru" on its label, but this is certainly an error, since the seeds originated in Buenos Aires, Argentina. Schauer says "Semina e Bonaria fuisse allata ferunt; ex affinitate typi tamen regnum Mexicanum patriam autumaverim. Mire similis V. ciliatae, vero tamen distincta pube, fol. laciniis magis elongatis, corolla et antheris super. omnis vestigio appendicis carentibus." He refers to the fruit as a capsule.

In Chittenden's "Dictionary" this species is said to be "very similar to V. diffusa, but differing in having the calyx-pubescence substrigose, not wide-spreading." Verbena diffusa, however, is a synonym of V. urticifolia L., with which our plant has no close resemblance whatever. Probably V. dissecta Willd. is intended.

Walpers (1845) classifies V. pogostoma in his Section Verbenaca, Subsection Inermes, Group Foliosae, Subgroup Macranthae, and Secondary Subgroup Aubletia, along with ten other species. It was introduced into cultivation in or before 1839. A common name for it is "Argentine verbena". It has been collected in anthesis in August and from October to December.

In all, 4 herbarium specimens and 6 mounted photographs, including photographs of the cotypes of both names involved, have been examined by me.

Citations: ARGENTINA: La Rioja: Castellanos s.n. [Herb. Mus. Argent. Cienc. Nat. 33885] (N). San Juan: Cuezzo 2255 (N). Santa Fé: Balegno 824 (N). Tucumán: Varela s.n. [22.IV.1944] (Ca--165879). CULTIVATED: Germany: Herb. Hort. Bot. Berol. s.n. [Oct. 1839; Macbride photos 17440, in part] (Kr--photo of cotype, N--photo of cotype, N--photo of cotype), s.n. [Aug. 1843; Macbride photos 17440, in part] (Kr--photo of cotype, N--photo of cotype, N--photo of cotype).

VERBENA PORRIGENS R. A. Phil., Linnaea 33: 195. 1864.

Synonymy: Verbena porrigenes R. A. Phil. ex Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 42, sphalm. 1942.

Bibliography: R. A. Phil., Linnaea 33: 195. 1864; F. Phil., Cat. Pl. Vasc. Chil. 221. 1881; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 1179. 1895; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 42 & 102. 1942; Moldenke, Lilloa 10: 345. 1944; Moldenke, Alph. List Invalid Names Suppl. 1: 26. 1947; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 102 & 199. 1949; Moldenke, Alph. List Cit. 3: 688, 813, & 940. 1949; Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Chile 25: 59. 1951; Moldenke, Résumé 122, 372, & 473. 1959; Muñoz Pizarro, Espec. Plant. Descr. Philippi 111. 1960; Moldenke, Résumé Suppl. 4: 5. 1962; Moldenke, Phytologia 8: 192 & 204 (1962) and 10: 298 & 299. 1964.

Suffrutescent, canescent-hispidulous with short white spreading hairs throughout; stems several, rising from a woody base, erect or ascending, 15--45 cm. long; leaves decussate-opposite, the larger ones about 1.6 cm. long and almost as wide, multipartite, strigose, with 2 or 3 lobes on each side, the lower ones only 2- or 3-lobed, the rest entire, all the lobes linear, obtuse or rounded at the apex, revolute-margined, densely covered with appressed white hairs; peduncles 1.4--5 cm. long; inflorescence capitate, later elongating; bractlets lanceolate, about 3.5 mm.

long or half as long as the calyx; calyx about 5 mm. long, hispid; corolla rose, its tube 8 mm. long; anther-appendages clavate, exserted.

The type of this little-known species was collected by Christian Ludwig Landbeck near Quilimari, Aconcagua, Chile, in December, 1861, and is deposited in the herbarium of the Museo Nacional de Historia Natural at Santiago. The Macbride photograph of an isotype in the Berlin herbarium, now destroyed, is inscribed on its label as though the collection were one of Philippi's, but the best evidence seems to point to Landbeck as the collector. Philippi says: "Unica species chilensis antherarum appendicibus clavatis, exsertis munita, quae antea innotuit, est V. sulphurea Sweet, quae colore floris, colore viridi foliorum, eorumque laciniis longioribus, angustioribus primo adspectu differt." The Skottsberg & Skottsberg 843, sometimes regarded as representing V. porrigens, is actually V. sulphurea D. Don.

Acevedo de Vargas (1951) cites the following 4 specimens not as yet seen by me: CHILE: Aconcagua: Landbeck s.n. [near Quilimari, XII.1861] (Sg--54729--type). Coquimbo: Reiche s.n. [Los Vilos, I.1899] (Sg--68380), s.n. [IX.1905] (Sg--54730). Valparaíso: Collector undesignated s.n. [Quillota] (Sg--42478).

In all, one herbarium specimen and 4 mounted photographs, including photographs of the types of both names involved, have been examined by me.

Citations: CHILE: Aconcagua: Landbeck s.n. [near Quilimari, Dec. 1861; Herb. Mus. Nac. Hist. Nat. Chile 54729; Macbride photos 17441] (Kr--photo of isotype, N--photo of type, N--photo of isotype, N--photo of isotype). Coquimbo: Herb. Mus. Nac. Santiago 14 (N).

xVERBENA PROSTIBULA Moldenke, Phytologia 5: 133. 1955.

Synonymy: Verbena hispida x simplex Dermen, Cytologia 7: 170. 1936. Verbena hispida Ruíz & Pav. x V. simplex Lehm. ex Moldenke, Résumé 366, in syn. 1959. Verbena simplex Lehm. x V. hispida Ruíz & Pav. ex Moldenke, Résumé 374, in syn. 1959.

Bibliography: Dermen, Cytologia 7: 170. 1936; Moldenke, Phytologia 3: 467 (1951) and 5: 133. 1955; Moldenke, Biol. Abstr. 30: 1093. 1956; Moldenke, Am. Midl. Nat. 59: 359. 1958; Moldenke, Résumé 224, 366, 374, & 473. 1959; Moldenke, Phytologia 8: 121 (1961) and 9: 296. 1963.

This is the hybrid between V. hispida Ruíz & Pav. and V. simplex Lehm., produced artificially by Dermen in Massachusetts and described by him in 1936. Since these two species do not grow in the wild together anywhere, as far as I am aware, there is little chance of ever finding this hybrid in Nature. Both species, however, occur in cultivation -- especially in Europe -- and the hybrid might have horticultural possibilities.

VERBENA PULCHELLA Sweet, Brit. Flow. Gard., ser. 1, 3: pl. 295. 1829 [not V. pulchella Greene, 1903].

Synonymy: Shuttleworthia pulchella Meisn., Pl. Vasc. Gen. 198. 1839. Shuttelworthia pulchella Meisn. ex Steud., Nom. Bot., ed. 2, 2: 575. 1841. Verbena pulchella Hort. ex Steud., Nom. Bot., ed. 2, 2: 750, in syn. 1841. Schuttleworthia pulchella Meisn. ex Morren, Belg. Hort. 20: 111, in syn. 1870. Verbena pulchella Spreng. ex Regel, Gartenfl. 28: 372. 1879. Verbena laciniata var. albida Herter ex Moldenke, Suppl. List Invalid Names 9, in syn. 1941. Schuttelworthia pulchella Meisn. ex Moldenke, Alph. List Invalid Names Suppl. 1: 19, in syn. 1947. Verbena pulcherrima Harvey ex Moldenke, Alph. List Invalid Names Suppl. 1: 26, in syn. 1947 [not V. pulcherrima Vilm., 1865].

Bibliography: Sweet, Brit. Flow. Gard. 3: pl. 295. 1829; Lodd., Bot. Cab. 16: pl. 1550. 1829; Maund, Bot. Gard. 3: pl. 70. 1829--1830; Sweet, Hort. Brit., ed. 2, 418. 1830; Reider, Ann. Blumisterei 7: 291--292 (1831) and 8: [pl. 12]. 1832; G. Don in Loud., Hort. Brit. Suppl. 2: 680. 1839; Meisn., Fl. Vasc. Gen. 198. 1839; Walp., Repert. 4: 13 & 34. 1845; Payer, Organog. Comp. Fl. pl. 115. 1857; Bocq., Adansonia 2: 106, 107, 131, & 132. 1861-1862; Bocq., Rev. Verbenac. 26, 27, 51, & 52. 1862; Vilm., Fl. Pl. Terre, ed. 1, 937--938. 1865; Morren, Belg. Hort. 20: 111--112. 1870; Ulrich, Internat. Wörterb. Pfl., ed. 1, 250. 1872; Rümpler in Vilm., Illustr. Blumeng., ed. 1, 1261--1262. 1873; Ulrich, Internat. Wörterb. Pfl., ed. 2, 250. 1875; Vilm., Alb. de Cliches, ed. 2, fig. 25680. 1888; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 895 & 1179. 1895; L. H. Bailey in A. Gray, Field Forest & Gard. Bot. 341. 1895; Haage & Schmidt, Cat. Général 93, no. 5920. 1898; Ed. Rodigas, Bull. Arboricult. Belg. 1902: 113. 1902; Briq., Ann. Conserv. & Jard. Bot. Genèv. 7-8: 297. 1904; Stapf, Ind. Lond. 6: 431. 1931; Grey & Hubbard, List Pl. Bot. Gard. Atkins Inst. 204. 1933; L. H. & E. Z. Bailey, Hortus, new rev. ed., 631 & 632. 1935; Herter, Revist. Sudam. Bot. 4: 186--187. 1937; Moldenke, Cult. Pl. 35. 1938; Moldenke, Annot. & Classif. List 108. 1939; Moldenke, Suppl. List Invalid Names 9. 1941; Moldenke, Alph. List Invalid Names 48. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 41, 44, 74, & 102. 1942; Moldenke in Lundell, Fl. Texas 3 (1): 44. 1942; Rosengurtt, Estud. Prad. Nat. Urug. 4: 8. 1944; E. L. D. Seymour, New Gard. Encycl. 1279. 1944; Augusto, Fl. Rio Grande do Sul 218, fig. 104. 1946; Moldenke, Alph. List Cit. 1: 84, 129, 212, & 219 (1946) and 2: 357, 358, 458, 532, 533, 565, 575, 579, & 620. 1948; Neal, In Gard. Hawaii 636. 1948; Moldenke, Castanea 13: 119. 1948; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 14. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 89, 94, 100, 106, 164, & 199. 1949; Moldenke, Alph. List Cit. 3: 671, 766, 780, 781, 798, 861, 874, 911, & 949 (1949) and 4: 1010 & 1233. 1949; Moldenke, Phytologia 3: 75 (1949) and 3: 290. 1950; Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 6: 2209 & 2212. 1951; Moldenke, Résumé 110, 120, 122, 128, 224, 343, 344, 368, 373, & 473. 1959; Moldenke, Résumé Suppl. 2: 13 (1960) and 3: 15. 1962; A. Putz, N. Y. Herald Trib., sect. 4, p. 18, February 4. 1962; Moldenke, Résumé Suppl. 7: 5, 7, & 9. 1963; Moldenke, Phytologia 9: 70, 71, 87, & 88 (1963) and 9: 394, 395, 397, & 403. 1964.

Illustrations: Sweet, Brit. Flow. Gard. 3: pl. 295 [in color]. 1829; Lodd., Bot. Cab. 16: pl. 1550 [in color]. 1829; Maund, Bot. Gard. 3: pl. 70 [in color]. 1829-1830; Reider, Ann. Blumisterei 7: 291 [in color]. 1831; Payer, Organog. Comp. Fl. pl. 115. 1857; Rümpler in Vilm., Illustr. Blumeng., ed. 1, 1262. 1873; Vilm., Alb. de Cliches, ed. 2, fig. 25680. 1888; Augusto, Fl. Rio Grande do Sul fig. 104. 1946.

Much-branched, creeping, perennial herb, to 50 cm. tall; branches ascending, densely spreading-hirsute; leaves decussate-opposite; leaf-blades ovate, 2.5—4 cm. long, pinnatifid-dissected, narrowed at the base into a winged petiole, rather densely hirsutulous on both surfaces, the segments broad, oblong, rather acute, somewhat revolute-margined; spikes terminal, pedunculate, solitary or ternate, densely congested-capitate, not elongating after anthesis; bractlets less than half as long as the calyx, densely white-villous; flowers with a strong but not unpleasant odor of vanilla; calyx cylindric, 6—9 mm. long, densely hirtellous; corolla hypocrateriform, varying from blue or violet to pink, purple-pink, purple, lilac, or rosy-lilac, perhaps also white (?), turning bluish-purple in drying, its tube scarcely surpassing the calyx, the limb about 7 mm. wide.

This species has been collected among grasses and weeds, among shrubs on shrubby mountainsides, on mountains, dunes, and seashores, in barrancas, hedgerows, maritime sands, fields, parks, campos, and rocky or stony places, at altitudes of 200 to 3500 meters, as well as at sea-level, flowering from August to February and in May. It was apparently introduced into cultivation in 1827. The name, V. pulcherrima Harvey, is based on Herb. Harvey s.n., collected from cultivated material in Pisa, Italy, in 1848, and deposited in the Dudley Herbarium at Stanford University. Verbena pulcherrima Vilm. is a synonym of V. laciniata (L.) Briq., V. pulchella Greene is V. racemosa Eggert, and V. pulchella var. maonetti (Regel) Regel is V. tenera var. maonetti Regel.

Hunziker reports this species as "rather frequent" in Buenos Aires province; Legrand found it "in terreno fresco algo sombreado"; while Gallinal and his associates found it in "ladera pratenses rocosas, lugar pastoreado" and "porte ascendente en lugar sin pastorea". Common names recorded for it are "beautiful verbena", "bouquet verbena", "hübsches Eisenkraut", "margarita morada", "moss verbena", "pretty vervain", "schönes Eisenkraut", "verveine délicate", "verveine gentille", and "verveine jolie" — the fourth and fifth of these, however, are applied to several other species in the genus.

Rümpler (1873) describes V. pulchella as follows: "Brasilien. - Einjährig, im Gewächshause ausdauernd. - Leicht behaart, stark verästelte Pflanze mit weitschweifigen, Wurzel schlagenden, niedergestreckten, dann aufrechten, ziemlich langen, aber nur bis zu 15—30 Centimeter sich erhebenen Aesten. Blätter gegenständig, fiedertheilig, mit linienförmigen spitzen Läppchen.

Blume violett-rosa, in einzeln odor zu drei stehenden, Anfangs dichten und doldenförmigen, aber während der Blüthe sich streckenden Aehren; Kelch behaart, zwei Mal länger, als die spitz-lanzettlich Blüthendeckblättchen; Blumenkrone zwei Mal länger, als der Kelch. Saum von mittler Grösze und mit verkehrt-herzförmigen Lappen." Because of his statement about the elongation of the inflorescence during anthesis, it seems obvious that he is not referring here to the same taxon to which we now apply this name. The colored illustration given in Reider, Ann. Blumisterei 8: [pl. 12] (1832) as V. pulchella also appears to be not this species at all, but V. tenera Spreng. instead. Neal (1948) records a "V. erinoides" from Hawaiian gardens, which she says is the same as V. pulchella -- her plants, however, examined by me, are V. tenuisecta Briq. The Baileys (1935) make the assertion that the material called V. dissecta and V. tenera in the horticultural trade is actually V. pulchella. I have seen material of all three of these species in cultivation, but most abundantly of V. tenera. Rümpler (1873) and Rodigas (1902) are of the opinion that V. tenera Spreng. and V. geraniifolia Hort. are synonyms of V. pulchella, but I regard V. tenera as a valid species and place V. geraniifolia in its synonymy.

Briquet (1904) suggested that V. sabini Sweet may be conspecific with V. pulchella, but I regard it as a variety of V. laciniata. Morren (1870) apparently regarded V. pulchella as a synonym of V. tenera, as did also Jackson (1895), Steudel (1841), and Walpers (1845).

The Loud., Hort. Brit. Suppl. 2: 680 (1839) reference is sometimes credited to W. Baxter, but apparently in error. A "V. pulchella corolla albida" is also recorded here and may refer to the same plant which Herter named V. laciniata var. albida, but I have not as yet seen any specimens of V. pulchella which were definitely white-flowered. Ulrich (1872 & 1875) speaks also of this plant as the "Whitish-corollaed Vervain". Herter 1805 was identified by him on the labels as "Verbena laciniata var. albida" -- on some of the labels he says "form. ad typ. verg." He does not, however, appear to state definitely on his labels that the flowers were really white, so I hesitate to formalize the variety.

Osten 3523 was identified by the collector as V. erinoides and as a hybrid between this taxon and "V. chamaedryfolia" which he designated as V. chamaedryfolia x erinoides Osten. He says: "Considerando la gran facilidad con que los horticultures de Europa cruzan la varias especies de Verbena, es muy particular la gran escasez de hibridas espontaneas entre las 3 especies mas comunes en la Banda Oriental, V. chamaedryfolia, erinoides & teucrioides, que se encuentran en los campos en grandes cantidades juntas en las mismas localidades. A pesar de haberme fijado mucho en lo años pasados, no he encontrado mas que 2 veces hibridas entre teucrioides & chamaedryfolia, una vez en varios exemplares & en todo 2 exemplares de chamaedryfolia x erinoides. Estos exemplares son bien intermediarios, las flores de un color rosado, de poca fragrancia: (chamaedry. tiene flores de un color colorado subido sin fragrancia, erinoides color violeta fragrancia muy pronunciada a vainilla)." What he refers to as "V. erinoides" seems to be V. pulchella, but his "V. chamaedryfolia x erinoides" I regard as typical V. dissecta Willd., at least insofar as I have seen specimens of it so labeled by him.

Material of V. pulchella has been misidentified and distributed in herbaria under the names V. erinoides Lam., V. dissecta Willd., V. crinoides Lam., and V. tenera Spreng. On the other hand, the J. G. Jack 8617 distributed as V. pulchella is actually V. elegans var. asperata Perry; H. Schneider s.n. [N. Y. Bot. Gard. Cult. Pl. R.95/34] is V. tenera Spreng.; and Bevoises s.n. [Green Farms, Aug. 1934], Clausen & Lawrence H.399, & Gresino s. n. [VIII.1928] are V. tenera var. maonetti Regel; while the Collector undesignated s.n. [in horto Anglica legi], Herb. Decaisne s.n. [H. P.], Herb. Harvey s.n. [h. M. P., junio 1843], Herb. Hort. Bot. Petrop. s.n., Herb. Meisner s.n. [20 Jul. 1837], and Neal s.n. [June 1, 1941] & s.n. [Feb. 28, 1945] are V. tenuisecta Briq.

The J. H. Cowen s.n. [Cornell U., Ithaca, April 1900], cited below, was grown from seed procured from Germany. The collector asks "is it V. tenera of South America or V. bipinnatifida of Texas?", to which Perry replied "Not V. bipinnatifida of Texas — V. tenera?"

In all, 78 herbarium specimens, including type material of one of the names involved, and 3 mounted illustrations have been examined by me.

Citations: BRAZIL: São Paulo: J. T. Lima s.n. [Herb. Jard. Bot. Rio de Jan. 55466] (N). URUGUAY: J. Anderson 103 (Bm); Arechavaleta 23 (Ug), 24 [Oct. 1876], 24 [3129; Nov. 1877] (Ug, Ug), 3131 [23] (Ug), s.n. [Feb. 1909] (Ug); Cabrera 3226 (N, N, N, Ug); Gallinal, Aragone, Bergalli, Campal, & Rosengurtt PE.5048 (N), PE. 5048 1/2 (N); Herter 181g [Herb. Herter 83911] (N), 1805 [Herb. Herter 96556] (Ew, La, Mi, N, N, V), s.n. [Herb. Osten 19204] (Ug); Legrand 85 (Ug), 215 (Ug), 1702 (Ug); Lombardo 2786 (N); Née 83 (Q); Osten 3112 (Ug), 3305 (Ug), 3313 (Ug), 3315 (Ug, Ug), 3316 (Ug), 3523, in part (Ug), 3923 (Ug), 14676 (Ug), 22006 (Ug, Ug), 22096 (Ug); Rosengurtt B.992 (N), B.2116 1/2 (N); Safford s.n. [Independencia, Oct. 24, 1886] (W—922264); Schröder 3523a (Ug), s.n. [Herb. Osten 16546, in part] (Ug); Seijo 650 (Ug), s.n. [24 Nov. 1884] (Ug); Teisseire s.n. (Ug). GORRITI ISLAND: Osten 4041 (Ug). CHILE: Antofagasta: Barros Valenzuela 8030 (N). ARGENTINA:

Buenos Aires: Boffa 330 (Ug); Cabrera 10352 (W--1988265); Eyerdam & Beetle 23039 (Ca--652428); A. T. Hunziker 4539 (N, N, S); Krapovickas 3086 (N); Martinez Crovetto 32 [A. G. Schulz 1899] (Sz); Osten 2678 (Ug), 2707 (Ug); Parodi 8563 [Herb. Osten 20938] (Ug, V), 12240 (N); Rodrigo 2339 (N); Troncoso 172 (N); Wall & Sparre s.n. [3/11/46] (Ew, Ew, Ew, Ew). Mendoza: Smitt s.n. [1890--91] (S, S). Santiago del Estero: Frenguelli 105 (N), 137 (N). Tucumán: Venturi 4295 (W--1591442). CULTIVATED: France: Herb. Hort. Bot. Huber 753 (M). Italy: Herb. Harvey s.n. [h. P., 1848] (Du--166493). New York: J. H. Cowen s.n. [Cornell U., Ithaca, April 1900] (N). LOCALITY OF COLLECTION UNDETERMINED: Collector undesignated s.n. (Ug, Ug). MOUNTED ILLUSTRATIONS: Lodd., Bot. Cab. 16: pl. 1550. 1829 (N); Sweet, Brit. Flow. Gard. 3: pl. 295. 1829 (N); Vilm., Alb. de Cliches, ed. 2, fig. 25680 (N).

VERBENA PULCHELLA f. LATILOBATA Moldenke, Phytologia 3: 281. 1950.
Bibliography: Moldenke, Phytologia 3: 281 & 289. 1950; Moldenke, Résumé 120 & 473. 1959.

This form differs from the typical form of the species in having the leaf-segments very broad, 3--7 mm. wide, and obtuse at the apex. The corolla is described as lilac.

The type of the form was collected by Mariano B. Berro (no. 4751) at Barra Santa Lucia, in the department of Montevideo, Uruguay, on October 30, 1907, and is deposited in the Britton Herbarium at the New York Botanical Garden. It is known thus far only from the type specimen.

Citations: URUGUAY: Berro 4751 (N--type).

VERBENA PULCHRA Moldenke, Phytologia 2: 476--477. 1948.
Bibliography: Moldenke, Phytologia 2: 476--477. 1948; Moldenke, Castanea 13: 117. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 94, 107, & 199. 1949; Moldenke, Phytologia 3: 75 & 136 (1949) and 3: 289. 1950; Stellfeld, Trib. Farmac. 19 (10): 167. 1951; E. J. Salisb., Ind. Kew. Suppl. 11: 263. 1953; Angely, Fl. Paran. 7: 6 & 13 (1957) and 12: 17. 1958; Moldenke, Résumé 110, 120, 128, & 473. 1959; Angely, Fl. Paran. 16: 79 (1960) and 17: 46. 1961.

Herb; stems procumbent or ascending, several, not branched, sharply tetragonal, sulcate between the angles, scabrous with many short reflexed hairs; principal internodes 3--8 cm. long; nodes more or less annulate; leaves numerous, decussate-opposite, usually with clusters of smaller ones in their axils; petioles slender, 5--8 mm. long, rather sparsely strigose with short antrorsely curved hairs, margined; leaf-blades chartaceous, somewhat lighter beneath, elliptic or narrow-lanceolate, varying to oblanceolate, 1.5--5.5 cm. long, 6--15 mm. wide, acute at the apex, attenuate or acuminate at the base, rather irregularly dentate from the apex almost to the base with rather broadly triangular acute teeth, slightly scabridous-strigillose above, rather softly short-pubescent beneath with bulbous-based hairs; midrib very slender, plane above, prominulent beneath; veinlet reticulation mostly indiscernible above, conspicuous (but not elevated) beneath; inflorescence terminal and in the uppermost axils, the floriferous portion very dense, at first flattened-subcapitate, later elongating to 3 cm. but remaining very dense; peduncles rather stout, 6--8.5 cm. long, tetragonal and sulcate like the stems, reflexed-pilose and more or less rough to the touch; bractlets lanceolate, 4--9 mm. long, 1--1.4 mm. wide, attenuate-acute or subacuminate at the apex, glabrous (or very sparsely pilosulous) except for the long-ciliate margins; calyx tubular, 10--12 mm. long, about 1 mm. wide, 5-costate, purplish especially toward the apex, ciliate-pubescent on the ribs, the teeth unequal, 1--2 mm. long, filiform-appendaged; corolla showy, blue or blue-violet to rose-violet or violet, its tube 15--17 mm. long, very sparsely and minutely puberulent or merely pulverulent on the outside above the calyx, its limb to 15 mm. wide, pilose in the throat.

The type of this species was collected by Per Karl Hjalmar Dusén (no. 9334) in wet thickets at Calmon, Paraná, Brazil, on March 13, 1910, and is deposited in the herbarium of the Naturhistoriska Riksmuseum at Stockholm. The calyxes on the type specimen are mostly infested with a fungus which forms tiny brown dots over the surface, which dots under the microscope reveal themselves to be composed of masses of tiny brown filaments. The species inhabits campos and, according to Arechavaleta, "tierras frescas herbosas", blooming from January to April and in October and November. Material has been misidentified and distributed in herbaria under the name "Verbena aff. phlogiphlora Cham."

In all, 19 herbarium specimens, including the type, and 4 mounted photographs have been examined by me.

Citations: BRAZIL: Paraná: Braga & Lange 255 (Bm); Dusén 9334 (F--photo of type, N--isotype, N--photo of type, S--type, Si--photo of type, Z--photo of type); Hatschbach 4369 (Z). Rio Grande do Sul: Henz 29682 (N, Rb); Malme 1026 (N, S), 1026a (S); Rambo 30980 (N). São Paulo: Brade 16268 [Herb. Jard. Bot. Rio de Jan. 42222] (N, N). URUGUAY: Arechavaleta 35 (N), s.n. [Tacuarembó, Nov. 1903] (Ug, Ug); Legrand 2561 (Ug); D. Wright s.n. [Cuñapiru, 1928] (Bm). ARGENTINA: Misiones: Ekman 1980 (N); G. J. Schwarz 2523 (N).

VERBENA PULCHRA var. PALUDICOLA Moldenke, Phytologia 2: 477. 1948.

Synonymy: Verbena menthaefolia Herter ex Moldenke, Résumé Suppl. 7: 9, in syn. 1963 [not V. menthaefolia Benth., 1839].

Bibliography: Moldenke, Phytologia 2: 477 (1948) and 3: 75. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 199. 1949; Moldenke, Résumé 120 & 473. 1959; Moldenke, Résumé Suppl. 7: 9. 1963.

This variety differs from the typical form of the species in its leaves being shorter, the blades only 2.4--4.3 cm. long, 1--2 cm. wide, and the corollas white except for a red "eye".

The type of the variety was collected by Wilhelm Gustav Herter (no. 99937) in a rather wet sandy marsh, at an altitude of 150 meters, exposed to the sunlight in an arroyo, at Reanqueras, Rivera, Uruguay, between March 24 and 27, 1907, and is deposited in the Britton Herbarium at the New York Botanical Garden. The taxon is known thus far only from the type specimen.

Citations: URUGUAY: Herter 99937 (N--type).

VERBENA PUMILA Rydb. in Small, Fl. Southeast. U. S., ed. 1, 1010 & 1337. 1903.

Synonymy: Verbena inconspicua Greene, Pittonia 5: 137. 1903. Verbena bracteoso-aubletia Hall ex Moldenke, Suppl. List Invalid Names 8, in syn. 1941. Verbena permila Rydb. ex Moldenke, Suppl. List Invalid Names 9, in syn. 1941. Verbena pmila Rydb. ex G. L. Fisher, Am. Bot. Exchange List 1946, sphalm. 1946. Verbena pumila Greene ex Moldenke, Résumé Suppl. 3: 40, in syn. 1962.

Bibliography: Eggert, Torreya 2: 124. 1902; J. K. Small, Fl. Southeast. U. S., ed. 1, 1010 & 1337. 1903; Greene, Pittonia 5: 137. 1903; Prain, Ind. Kew. Suppl. 3: 187. 1908; J. K. Small, Fl. Southeast. U. S., ed. 2, 1010. 1913; E. D. Schulz, 500 Wild Fls. 178. 1922; E. D. Schulz, Texas Wild Fls. 337. 1928; Perry, Ann. Mo. Bot. Gard. 20: 248--250, 312, 314, 338--339, & 356. 1933; Cory, Texas Agr. Exp. Sta. Bull. 550: 89. 1937; E. L. Little, Am. Midl. Nat. 19: 385. 1938; Moldenke, Prelim. Alph. List Invalid Names 45 & 46. 1940; Sperry, Sul Ross State Teach. Coll. Bull. 22: 41. 1941; Moldenke, Suppl. List Invalid Names 8 & 9. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 10, 11, 13, 14, 19, & 102. 1942; Moldenke, Alph. List Invalid Names 45, 48, & 49. 1942; H. S. Gentry, Carnegie Inst. Wash. Publ. 527: [Rio Mayo Pl.] 222 & 306. 1942; Moldenke in Lundell, Fl. Texas 3 (1): 19, 34, & 45--46. 1942; Moldenke, Known Geogr. Distrib. Verbenac. Suppl. 1: 2. 1943; Moldenke, Phytologia 2: 67, 74, 76, 82, & 116-117 (1945) and 2: 165. 1946; G. L. Fisher, Am. Bot. Exchange List 1946. 1946; Moldenke, Alph. List Cit. 1: 13, 27, 35, 42, 47, 49, 59, 77, 89, 93, 108, 115, 122, 125--129, 138, 140, 157, 161, 176, 193, 194, 201, 203, 213, 216, 232, 242, 243, 253--255, 257, 267, 269, & 281. 1946; Tolstead & Cory, Field & Lab. 14: 60. 1946; Moldenke, Phytologia 2: 328 & 383. 1947; Moldenke, Alph. List Invalid Names Suppl. 1: 26. 1947; Moldenke, Castanea 13: 112. 1948; Moldenke, Wrightia 1: 234--235. 1948; Moldenke, Alph. List Cit. 2: 398, 400, 403, 407, 450--453, 470, 474--479, 488, 495--497, 506, 514--517, 519, 520, 522, 526, 539--541, 554, 559, 560, 581, 585, 593, 595--598, & 607--609 (1948), 3: 665, 667, 671, 678, 680, 681, 683, 707, 709, 717, 722, 723, 726, 729, 769, 770, 772, 773, 784--786, 788, 789, 795--797, 800, 813, 824, 833, 838, 844, 850, 852, 857, 874, 882, 886, 914, 915, 936, 944, 946, 953, 954, 962, 970, & 978 (1949), and 4: 979, 989--992, 998, 1004, 1010, 1013, 1072, 1075, 1085, 1098, 1107--1109, 1115, 1121, 1122, 1129, 1138, 1139, 1143, 1149--1151, 1162, 1164, 1166, 1172, 1182--1184, 1193, 1203, 1207, 1212, 1216, 1220, 1225, 1226, 1238, 1239, 1241, 1248, 1254, 1291, & 1294. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 18, 21, 24, 25, 33, & 199. 1949; Moldenke, Phytologia 3: 132. 1949; Shinners, Spring Fl. Dallas 325. 1958; Moldenke, Résumé 22, 26, 29, 31, 39, 360, 367, 372, & 473. 1959; Jones, Rowell, & Johnston, Flow. Pl. & Ferns Tex. Coast. Bend 144. 1961; Irwin, Roadside Flow. Tex. 189—190, pl. 39. 1961; Lewis & Oliv., Am. Journ. Bot. 48: 639—641. 1961; Moldenke, Phytologia 8: 123 (1961) and 8: 196, 212--214, 231, 279, 401, 435, & 437. 1962; Moldenke, Résumé Suppl. 3: 6, 7, & 40 (1962), 4: 4 (1962), 5: 4 (1962), 6: 3 & 10 (1963), and 7: 2 & 3. 1963; Moldenke, Phytologia 9: 17, 18, 24, 62, 143, 193, 195, 197, 199, & 202. 1963; Shinners, Sida 1: 298. 1964.

Illustrations: Lewis & Oliv., Am. Journ. Bot. 48: 640, fig. 2. 1961.

Low soft-hairy annual herb, varying from erect to ascending, partly decumbent, decumbent, procumbent, or prostrate; roots fibrous; stems usually several from a common base, simple or branched at the base, decumbent-ascending, to 30 cm. long, rooting at the lower nodes, hirsute, often finely glandular, the bark pale-green; branches decumbent, to 15 cm. long; leaves decussate-opposite, deltoid to ovate, 1.5--3 cm. long, often obtusely triangular with a cuneate or truncate base contracted into a short narrowly margined petiole, trifid, occasionally lobed, the divisions variously toothed, incised, or dissected, appressed-hirsute on both surfaces; spikes terminal, short-pedunculate or sessile, fairly compact; bractlets linear-lanceolate, almost as long as the calyx, hispid-hirsute; flowers very small, odorless; corolla small, hypocrateriform, varying from blue or pale-blue to pink, deep-pink, dark-pink, bright-pink, orchid-pink, rose-pink, deep rose-pink, pink-lavender, violet-rose, pale-lavender, pale-violet, purplish, purplish-white, reddish-purple, pale-purple, purple, or pinkish-purple with a minute yellow "eye", sometimes described as pink with a paler "eye", its tube 6—10 cm. long, a little longer than the calyx, slightly (if at all) pubescent on the outer surface, its limb 2--5 mm. wide; anther-glands minute or absent; fruiting-calyx about 6 mm. long, pubescent on the outside, hispidulous along the veins, sometimes finely glandular, its lobes short and subulate; fruit cylindric; cocci 2.25—3 mm. long, deeply wrinkled or reticulate-scrobiculate except at the base, the commissural faces muriculate; chromosome number: n = 10.

The type of this common species was collected by Benjamin Franklin Bush (no. 1275) at Catoosa, Rogers County, Oklahoma, on May 8, 1895, and is deposited in the Columbia University Herbarium at the New York Botanical Garden. Cotypes of V. inconspicua were collected by Samuel Mills Tracy and Franklin Sumner Earle -- no. 106, on the plains west of Pecos, Reeves County, on April 20, 1902, and no. 178, in the foothills of the Davis Mountains, Jeff Davis County, Texas, on April 23, 1902. The type of V. bracteoso-aubletia was collected by Elihu Hall (no. 431, in part) in dry hills at or near Austin, Travis County, Texas, in May, 1872. On his labels Hall seems to credit the hybrid name to Asa Gray, saying "Verbena bracteoso-aubletia? so says Gray, but a distinct species" and "V. bracteoso-aubletia fide Gray, but a good fertile species."

It should be noted here that the V. pumila f. albiflora Standl. is actually a synonym of V. quadrangulata Heller. The "V. pumila" of Irwin (1961) is V. tenuisecta Briq., as is plainly indicated by the plate.

Tolstead & Cory (1946) refer to V. pumila as "an inconspicuously flowered weedy plant." Runyon describes the fruit as "a cylindric capsule". C. M. Rowell 4776, cited below, bears a notation on its label: "with pale purple to white corollas", and so may be a mixture with f. albida Moldenke.

Verbena pumila has been found by collectors at the edge of woods, along roadsides, gravel or rocky clay roadsides, railroad tracks and rights-of-way, arroyos, and the green edges of dried-up streams, growing in moist or dry soil, sandy, dry sandy, or rich sandy soil, black or shaded soil, rocky or rocky-gravelly soil, red or sandy clay soil, limestone soil, much overgrazed coarse red granitic or recently disturbed soil, sand or deep sand, sandy or clay loam, sandy or red sandy clay, or gypsum; in open or low open ground, low damp or moist ground, open sandy or dry open ground, in fields, old fields, and cultivated fields, at the edge of oak woods, in meadows and sandy fields, wet or open rocky meadows, in woods, open or wet woods, open oak or postoak woods, and alluvial woods, in pine forests and sandy pastures, in draws and creek-bottoms, llanos and catch-basins, glades and ungrazed or open pastures, lowlands, limestone scab-lands, desert scrub, in granite or cultivated areas, in dry draws and dry pastures, moist banks and roadside ditches, in creek valleys and river-bottoms, yards, flat sandy areas, floodplains, dry open pastures, low scrub on hilltops, and the sandy bottoms of floodplains. It has been encountered in soil pockets among granite boulders, on hills of granite boulders, in Frank's conglomerate limestone formation, in Woodford chert formation, and in Seguin sand formation of the Wilcox group. It is described as a pioneer in abandoned fields and has been collected also on mesquite savannas, the floors of canyons, gravel and sand bars, small streams, cliffs, limestone ledges and mesas, xeric rocky limestone outcrops, the sides and tops of buttes, dry, sandy, or granite slopes, vacant lots, road shoulders, plains and high rocky plains, flats and clay, gypsum, or open limestone flats, sandy or granite hillsides, foothills and dry granite foothills, as well as on hills and sand hills, rocky and dry rocky hills. limestone and high limestone hills, dry, clay, sandstone, or gypsum hills. It is said to grow on prairies, sandy or loose-sand prairies, and on calcareous and mesquite prairies.

In Texas, in general, it is described as an inhabitant of fields, prairies, and chaparral, meadows, pastures, river-terraces, woods, and sandy slopes and hillsides, blooming from January to August, in the western, central, and southern parts of the state, from Reeves, Jeff Davis, and Brewster to Cameron, east to Wharton and Walker, and north to Grayson and Childress Counties. Actually, it has been collected in anthesis in every month of the year, fruiting from February to June, August, November, and December, growing at altitudes of 10 to 2830 meters. Jones, Rowell, & Johnston (1961) state that it grows in pasture openings, roadsides, mostly on sandy loam, flowering in spring. Clemens says that it inhabits the "tropical life zone"; Hanson states that it is "common in chaparral and openings", "abundant on prairies", and a "frequent weed in fields"; Warnock found it "scattered on sandy silt flats", while Runyon says "frequent in sandy soil" and "common throughout Cameron County; in the sandy region this plant roots freely at the nodes; it is frequent but not common in Kenedy County", Texas. Bray maintains that it is "very common in dry ground" in Travis County, where Warnock found it "frequent in sandy banks" and Ely "in black soil containing 38 percent silicon dioxide derived from basalt".

In Archer County, Texas, Whitehouse found V. pumila to be "very abundant and forming masses of color in scattered mesquite" and in Montague County in "alluvial sand near postoak woods." Rowell calls it "occasional" in San Patricio County. Shinners (1958) describes it from "sandy, silty, or gravelly ground, frequent and locally common, Prairie Border westward. Late March--May". McCart found it "in light tan loose soil of stabilized sand dunes", while Cory says that it is "frequent in waste ground around shallow ponds" in Hamilton County and "infrequent on roadsides" in Johnson County. Johnson encountered it as "frequent in slightly moist sandy clay loam partly shaded by mixed brush" in Karnes County. Hamby notes "also in Medina, Zavala, Real, Dimmit, & Bandera Counties". Williges found it "occasional in undisturbed caliche." In Garza County it is described by Rowell as "occasional in sandy loam in flats below rim of canyon", while the same collector, in San Patricio County, notes "locally frequent but not in large numbers in deep loose sand along and adjacent to river." In the same county Gould & Hycka found it in "grassland-shrub area along river bank." Lathrop discovered it in Burnet County in sandy soil of xeric hillside with granite outcrops and juniper, Yucca, and cactus common.

In Oklahoma it is said by Eskew to be "common along streams", by Engleman "common in clay banks", and by Stevens "common in open woods"; Waterfall found it "in shallow soil on limestone conglomerate", and Robbins "in moist grassy depressions on open rocky slopes in open oak-hickory woods", while Hopkins reports it from "dry rocky pastures originally shortgrass prairie", "in and along streambanks and in sloughy meadows by creeks", "on limestone slopes of deep wooded ravines", and "in rock pastures in clumps of persimmon (Diospyros) and hackberry (Celtis)". In Sonora it is said by Gentry to be found in "arroyos and milpas, Lower Sonoran; scattered in the arroyos but more colonial in the milpas" and in the "Short-tree area".

Common and vernacular names recorded for this species are "bartanucha", "kawiyo", "hairy verbena", "low verbena", "pink verbena", "pink vervain", "small-flowered verbena", and "wild verbena".

Material of V. pumila has been misidentified and distributed in herbaria under the names V. ambrosiafolia Rydb., V. aubletia Jacq., V. bipinnatifida Michx., V. bipinnatifida Nutt., V. bracteata var. brevibracteata Gray, V. bracteosa Michx., V. bracteosa var. brevibracteata Gray, V. canadensis (L.) Britton, V. canescens H.B.K., V. ciliata Benth., V. ciliata var. longidentata Perry, V. delticola Small, V. lambertii Sims, V. quadrangulata Heller, V. racemosa Eggert, V. wrightii A. Gray, Helleranthus quadrangulatus (Heller) Small, and even Glecoma hederacea L. in the Lamiaceae. The Carleton 134 collection bears a note reading "V. bipinnatifida Nutt., a dwarf form. This species and V. aubletia evidently run together." Hayes 610 was first identified as V. bipinnatifida, then as V. ciliata, and finally as V. pumila.

On the other hand, the R. Runyon 2359, 2366, & 2499, distributed as V. pumila, are f. albida Moldenke; Shreve 7169 is actually the type collection of V. bajacalifornica Moldenke; Reynaldo Ramirez 36 & Waterfall 13097 are V. bipinnatifida Nutt.;H. C. Hanson 304 is V. ciliata var. longidentata Perry; B. H. Warnock 14693 is V. quadrangulata Heller; B. H. Warnock 46135 & 47011 are V. racemosa Eggert; and G. J. Goodman 2398 & 2412 are V. wrightii A. Gray. The A. A. Heller 1385, previously cited by me as V. pumila, is actually V. ciliata Benth., while Clover 567 is V. teucriifolia Mart. & Gal. The E. Hall 431 and M. Hawkins 37 are mixtures with V. bipinnatifida Nutt.; H. C. Hanson 322 and Ruth 110 are mixtures with V. ciliata var. longidentata Perry; Rose, Standley, & Russell 12745 is a mixture with V. gooddingii var. nepetifolia Tidestr.; Parry, Bigelow, Wright, & Schott 830 is a mixture with V. racemosa Eggert; and Wencurtin s.n. [5-2-1916] is a mixture with V. wrightii A. Gray. Edw. Palmer 246 is a mixture with V. bracteata Lag. & Rodr. and V. canadensis (L.) Britton -- apparently Asa Gray combined three of Palmer's field numbers under the one number "246": his original no. 21, collected on April 6 in Caddo County, appears to be the V. canadensis portion, and his original no. 167, collected on May 22 in the same county, is V. bracteata, leaving his original no. 438, collected on June 24 in Garvin or possibly in Johnston County, as V. pumila. Edw. Palmer 247 is also a mixture with V. canadensis -- here Gray combined two of Palmer's original field numbers under "247": his original no. 260, collected on June 11 in Garvin County, seems to have been V. canadensis, while his original no. 390 , collected on July 1 either in Johnston or Atoka County, seems to be V. pumila. The printed labels on all these are inscribed "On the False Washita between Fort Cobb and Fort Arbuckle".

Lundell & Lundell 10226 was determined by me and distributed as V. quadrangulata Heller, but the United States National Herbarium sheet does not exhibit beaked cocci. The E. J. Palmer 13562 specimen in the same herbarium has cocci with definite beaks and is therefore cited by me under V. quadrangulata. E. L. Little says of his no. 472: "V. bracteosa. Possibly a hybrid with V. canadensis as the bracts are short", but to me the specimens appears to be typical V. pumila. The Lindheimer 1075 collection may be from either Comal or Comanche County -- its label is inscribed "Comanche Spring: New Braunfels, etc." The printed labels on C. Wright 1500 are inscribed "Coll. N. Mex.", but Perry (1933) cites the collection from "southwest Texas, 1851-2". J. Frank Normand's surname is incorrectly written "Norman" on some labels.

Perry (1933) cites the following 66 additional specimens not as yet seen by me: OKLAHOMA: Comanche Co.: M. K. Clemens 11752 (E). Johnston Co.: H. W. Houghton 2570 (G). Murray Co.: Emig 401 (E); G. W. Stevens 28 (E, G); Stratton 11 (E). Rogers Co.: B. F. Bush 1275 (E--isotype). TEXAS: Bastrop Co.: E. J. Palmer 33367 (E). Bexar Co.: B. F. Bush 1185 (E); Clemens & Clemens 976, in part (E); Eggert s.n. [San Antonio] (E); G. Jermy 209 (G), s. n. [Bexar Co.] (E); Trelease 99 (E); Wilkinson 8 (E), 108 (E). Blanco Co.: E. J. Palmer 13281 (E). Cameron Co.: H. C. Hanson 322 (G), s.n. [Brownsville, 23 Jan. 1919] (E). Comal Co.: Lindheimer 434 (E), 1075 (E, F, G). Comanche Co.: Eggert s.n. [Round Top Mountain, 9 May 1900] (E), s.n. [near Comanche, 10 May 1900] (E). Dallas Co.: J. Reverchon 738 (E), 1963 (E, F, G), 2117 (E). Gillespie Co.: G. Jermy 184 (E). Haskell Co.: Morton s.n. [Haskell, 1898] (E). Hood Co.: Eggert s.n. [near Granbury, 6 May 1900] (E). Howard Co.: Eggert s.n. [Big Spring, 11 June 1900] (E). Jeff Davis Co.: Tracy & Earle 178 (E, F, G). Kerr Co.: E. J. Palmer 9278 (E), 10003 (E). Reeves Co.: Tracy & Earle 106 (E, F, G). San Saba Co.: E. J. Palmer 11843 (E). Tarrant Co.: Ruth 110, in part [Polytechnic, 10 April 1913] (E), 110, in part [Tarrant Co., June 1913] (G). Travis Co.: E. Hall 428 (G), 431, in part (E); E. J. Palmer 9339 (E); M. S. Young s.n. [Austin] (E, G). Uvalde Co.: E. J. Palmer 13562 (E). Victoria Co.: Eggert s.n. [near Victoria, 11 April 1900] (E, G). Walker Co.: E. J. Palmer 13175 (E). Wharton Co.: E. J. Palmer 4840 (E), 4977 (E). County undetermined: Lindheimer III.501 (E, F, G); C. Wright 1500 (D, E, F, G). NEW MEXICO: County undetermined: C. Wright 1501 [1851--2] (D). MEXICO: Sinaloa: M. E. Jones 23243 (E). Sonora: Edw. Palmer 326 (G). She says "Verbena pumila has often been confused with V. quadrangulata and, superficially, closely resembles it, but is readily separated on the beakless nutlets." The "Reverchon 1963" which she cites is cited by me below as "J. Reverchon s.n. [Curtiss 1963]" -- her "NY" specimen is actually in the Barnard College Herbarium. Her "NY" citation for C. Wright 1500 is based on a Torrey Herbarium specimen. She cites Lindheimer 434 from Comal County, but I cite it below from Bexar County. She cites "V. brevibracteata Eggert, Torreya 2: 124. 1902, not V. bracteosa var. brevibracteata Gray, Syn. Fl. N. Am. 2^1: 336. 1878" as a synonym of V. pumila. However, Eggert plainly bases his binomial on the trinomial of Gray and the latter belongs in the synonymy of V. bracteata Lag. & Rodr. The names, V. brevibracteata Eggert and V. brevibracteata (A. Gray) Eggert, therefore, which in my previous publications have been reduced to V. pumila belong, instead, in the synonymy of V. bracteata.

In all, 608 herbarium specimens, including the type collections of all the names involved, and 3 mounted illustrations and clippings have been examined by me.

Citations: ARKANSAS: Sevier Co.: Brinkley 47 (Au). OKLAHOMA: Beckham Co.: C. T. Eskew 1605 (Ok). Blaine Co.: Cutter s.n. [Salt Creek Canyon, May 5, 1951] (Ca--986212, Ok); J. Engleman 1270 (Ok), 1274 (Ok), 1275 (Ok); G. J. Goodman 2377 (Gg--310869, Io--143272, N, Ok, Se--41665); J. B. Taylor 112 (St). Caddo Co.: D. H. Dunn 3 (St--20059); Edw. Palmer 245 (C, C). Canadian Co.: M. Hopkins 1399 (Ok). Carter Co.: M. Hopkins 4693 (S); A. G. Payne 37 (Ok); Rice 36 (Ok); Rinehart 192 (Ok). Cherokee Co.: C. S. Wallis 546 (St). Cleveland Co.: Hambrack 51 (Ok--10284); Jeffs 83 (Ok--14956); M. Nielsen s.n. [May 16, 1924] (Ok--10278). Comanche Co.: P. V. Beck 144 (Ok); Bull 38 (Ok--14911); Chilcott s.n. [Lawton, 6 April 1926] (Um--20); M. K. Clemens 11752 (Ba); C. T. Eskew 1543 (N, Ok), 1570 (Ok), 1676 (Ok); S. Fry 173 (St--14010), s.n. [April 23, 1938] (Gg--310870); M. Gates s.n. [April 2, 1950] (Ok); Hopkins, Nelson, & Nelson 199 (Au--122517, Ca--742198, Ok), 970 (Ok); E. L. Little 472 (Ok--16614); D. McLean 273 (Hi--152271, St--17800); W. S. Myers 314 (Ok); Waterfall 11938 (Au--122514, St), 13073 (St, W--2260919). Custer Co.: Mericle 495 (Ok). Garvin Co.: Edw. Palmer 246, in part [438] (T). Grady Co.: Dahms 31 (St--9257); Nelson, Smith, & Merkle 107 (Ok). Greer Co.: Bull s.n. [April 25, 1927] (Ok--15043); Logan 50 (Ok). Harmon Co.: Waterfall 9410 (St), 13126 (Au--123206, St, W--2260941). Harper Co.: G. J. Goodman 2398 (Ok). Jackson Co.: B. E. Cole 45 (St--21763); Demaree 12218 (Ok--20379); E. L. Little 532 (Ok--10317); Small & Wherry 12204 (N). Jefferson Co.: Rohrbaugh 493 (Ok). Johnston Co.: H. W. Houghton s.n. [G. W. Stevens 3570] (N); Edw. Palmer 247, in part [390] (T); G. T. Robbins 3256 (Ca--965993, Ok). Kingfisher Co.: Byers 203 (St--14482); J. Engleman 161 (Ok); M. E. Jones s.n. [May 1, 1899] (Po--248005). Kiowa Co.: Ferguson, Buttram, & Buttram 13 (Ok); M. Hopkins 3023 (Ok). Logan Co.: J. Engleman 1276 (Ok); C.

C. Smith 510 (Ok). Major Co.: Goodman & Waterfall 4204 (Au—122518, N, Ok, St). McClain Co.: M. Hopkins 1278 (Ok). McCurtain Co.: Demaree 12630 (Ok—22232); Waterfall 15897 (Hi—195395, Hi--200233, St). Murray Co.: J. F. Brenckle 48066 (N, W--2003823); Coleman 18 (We); Couch C-6 (Ok); E. E. Dale 19 (Ok), 297 (Ok); Demaree 12292 (Ok--22245); G. J. Goodman 2079 (Ok—17715); M. Hawkins 37, in part (Ok), 39 (Ok); M. Hopkins 2757 (Ok), 2766 (Ok), 4802 (Ok), 5091 (Ok), 5735 (Ok), 5961 (Ok); Hopkins, MacDowell, & Copeland 6390 (Ok); Hopkins, Nelson, & Nelson 139 (Au--122516, Ok), 150 (Ok), 159 (Au, Au--122519, Ca--742336, N, Ok, S, St--26117, W—1862729), 905 (Au, Au--122515, Ca—733376, Mv, Ok); D. J. Hutchinson 75 (St); Rice 23 (Ok); G. T. Robbins 2449 (Ca--903956, Ok); Stratton 11 (N, St--26120, St--25121); G. W. Stevens 28 (Du--65694, N, Ok, Ok, St—9221, Ur, W--588952), 28b (Ok—20731), A.28 (St—9220); Tripp 122 (St--9258). Muskogee Co.: M. Hopkins 3978 (Ok); E. L. Little 1576 (Ok—10316). Oklahoma Co.: M. A. Carleton 134 (Ka, W); Waterfall 389 (Ok), 1117 (Ok, St), 2600 (Ok), 2622 (Ok, St). Payne Co.: F. Clark 254 (St--9256); Kenworthy 23 (Au). Rogers Co.: B. F. Bush 1275 (C--type). Sequoyah Co.: C. S. Wallis 6490 (Au—171374, St). Stephens Co.: Mericle 614 (Ok); Waterfall 3652 (Ok, St). Washita Co.: Stratton 4295 (St--26133, St—26134); Waterfall 11916 (St). County undetermined: G. W. Stevens A.15.5 (Ok). TEXAS: Archer Co.: Purcell 4 (Au), s.n. [Archer City, April 4, 1934] (Au); Whitehouse 9555 (N, No—14970), 9614 (Mi, N). Atascosa Co.: Mebane s.n. [Pleasanton road, 3/2/1926] (Wi); E. J. Palmer 11231 (Ca--425606). Bastrop Co.: Bogusch 748 (W--1285713); H. H. Duval 14 (W--1569751); Marrs s.n. [Smithville, 3-17-1930] (Au); McCart 5705 (Au--122480); E. J. Palmer 33367 (N, W--1532535). Baylor Co.: Whitehouse 9630 (Mi, N). Bee Co.: F. B. Jones 1732 (Ww); M. E. Jones 29191 (Po--199869). Bell Co.: Normand s.n. [4/4/28] (Au); Wolff 607 (Tr--16210), 1373 (Hp, Tr--16212). Bexar Co.: Clare 524 (Gg—267606); Clemens & Clemens 975 (Po--69915), 976, in part (N, Po--69562); Havard s.n. [San Antonio, March 1882] (W--147574, W--218872); G. Jermy 84 (W--315683), 85 (W--315684), s.n. [1904] (N), s.n. [San Ant.] (N, N); Kidder s.n. [San Antonio, 25 Mch. '85] (Oa--10738); Lindheimer 434 (Ka); Metz 152 (N), 524 (I, I, S), 2479 (N), 3246 (Pl—151578); Patoni s.n. [San Antonio, Marzi 1914] (Me, Me); Ripley & Barneby 4143 (Gg--301324, N); E. D. Schulz 767, in part (Wi), s.n. [So. S. A., 4-14-22] (Au), s.n. [9 mi. so. San Antonio] (Wi, Wi). Blanco Co.: E. J. Palmer 13281 (B); Tharp s.n. [3/13/38] (Ca--882799). Bowie Co.: Tharp s.n. [Smithville, 4-16-1932] (Au). Brazos Co.: Cory s.n. [College Station, 4-9-26] (Tr—16204); H. B. Parks 144 (St), s.n. [College Station, December 14, 1946] (Au--122569); Reeves 198 (Cs); Rowell

9051b (N); Trew 188 (Au--122577). Brewster Co.: Cory 28682 (N); Cutler 672 (Tr--21141); C. Newman s.n. [Sperry T.127] (Om); Parks & Cory 18716 (Tr), 18717 (Tr); Sperry 493 (W--1679313), T.127 (W-1679250), T.565 (Om), T.566 (Fs, Om); W. P. Taylor s.n. [3-31-44] (Au); B. H. Warnock C.800 (N), W.166 (N). Brooks Co.: Ecology Class Univ. Texas s.n. [Falfurias, 3.2.30] (Au); Lundell & Lundell 10071 (Ld, N). Burnet Co.: Cory 54029 (Rf); E. W. Lathrop 2020 (Lw); C. L. Lundell 15050 (Rf); C. M. Rogers 6668 (Au--122565); Whitehouse s.n. [Marble Falls, 4.13.30] (Au). Caldwell Co.: Mc Bryde s.n. [3/6/31] (Au), s.n. [Spr.-Sum. 1931] (Au). Cameron Co.: J. F. Brenckle 47-338 (N); Cory 28300 (N), 28308 (N); Fleetwood 3442 (Au--192005); H. C. Hanson 304 (N), 322, in part (Bl--42329, Ka--60567, Mi, N, Ur, W--982768), s.n. [Brownsville, Jan. 30, 1919] (Au); F. L. Lewton 214 (Ar--271609, W); Tharp 1871 (Au, W--1203149); C. H. Townsend 8 (W--279251). Childress Co.: Biology Class Univ. Texas s.n. [Childress, May 1930--31] (Au). Coke Co.: Cory 37143 (N, N). Comal Co.: Lindheimer 1075 (Au, Br, Ca--147516, Me, Me, Me, N, Ok--10350, Up--48538, W--502448). Comanche Co.: Phipps s.n. [Comanche, April 1931] (Au). Cooke Co.: D. S. Correll 16280 (Rf). Crosby Co.: C. O. Erlanson 1160a (Mi); Wolff 2031 (Tr--16213, W--1623983). Dallas Co.: Boll s.n. [1871] (Cb); I. E. Diehl 6 (Po--248006); Lundell & Lundell 8578 (Ld, Mi, Mi, N, N), 9178 (Ld, Mi), 12818 (Rf, Sm); J. Reverchon 738 (Up--17102, W, W--147573), s.n. [Curtiss 1963] (Bc), s.n. [Curtiss 1963**] (Go), s.n. [April 1878] (Bc); M. R. Stephenson 199 (W--1580366), s.n. [vicinity of Dallas, Apr. 1, 1928] (W--1580365), s.n. [near Dallas, Apr. 6, 1929] (W--1580488). Denton Co.: B. B. Harris s.n. [Spring '26] (Nt, Nt); Lundell & Lundell 8431 (Ld, Mi, N); McCart 1597 (N, Nt). Dickens Co.: Parks & Cory 13619 (Tr--16205). Dimmit Co.: Hoglund s.n. [Carrizo Spr., 4.6.30] (Au). Duval Co.: Croft 6515 (W--147572). Eastland Co.: Cox s.n. [Rising Star, 4-22-31] (Au); H. E. Parks 14393 (Md); Parks & Cory 13146 (Tr--16201), 14392 (Tr--16201); Wolff 2057 (Tr--16211). Ector Co.: Lundell & Lundell 11401 (N, Rf). Edwards Co.: Cory 37068 (Au), 37070 (N, N), 53678 (N); Cutler 789 (Ba); M. E. Jones 26220 (Du--235291, Gg--237846, Po--178867), 26228 (I, Po--178363). Erath Co.: Gough s.n. [3/25/21] (Au). Fannin Co.: Mrs. J. M. Milligan s.n. (W--504332). Fisher Co.: T. M. Shepherd s.n. [Ray's Pasture, Grady, Mch. 31, 1901] (W--413916). Frio Co.: Barkley, Painter, & Lucas 14201 (S); Painter, Lucas, & Barkley 14201 (Au, Ok), 14213 (Au, B, Ok, S). Garza Co.: C. M. Rowell 5636 (Au--195257). Gonzales Co.: Bogusch s.n. [2-20-1926] (Au); Johnston & McCart 5226 (Au--122473); E. D. Schulz s.n. [Ottine, Spring 1924] (Wi); Tharp s.n. [Ottine, 3-21-36] (Au). Grayson Co.: Harold Gentry 87 (Au), 50-94 (Au--122574);

McCart 1575 (Au, N, Nt, W--1825822); Van Meter 11 (N, N). Guadalupe Co.: Johnston & McCart 5037 (Au--122474). Hamilton Co.: Cory 54000 (Rf); Wolff 2091 (Tr). Hardeman Co.: C. R. Ball 1114 (N, W--501587); Herb. Univ. Texas s.n. [Quanah, 4-21-1931] (Au); Parks & Cory 13373 (Tr--16209); Science Dept. Univ. Texas s.n. [4/21/31] (Au). Harris Co.: G. L. Fisher 338 (W--503329). Hays Co.: Friesner 10401 (Bt--38740); Stanfield s.n. [San Marcos, Aug. 1897] (N). Hidalgo Co.: Cory 28214 (N). Hockley Co.: Rachaner 131, in part (Au), 135 (Au, N). Howard Co.: Parks & Cory 12538 (Tr). Jack Co.: Whitehouse 15311 (Sm). Jeff Davis Co.: Tracy & Earle 178 (Au, Cm, Es, It, N, N--photo, Tr, W--441837, Z--photo); Warnock, Hinckley, & McVaugh 3795 (N). Jim Hogg Co.: McCart 7480 (Ok). Jim Wells Co.: Freeborn & Freeborn 315 (N). Johnson Co.: Cory 53968 (Rf); Whitehouse s.n. [Cleburne, May 3, 1931] (Au). Jones Co.: N. C. Henderson 63-32 (Au--217678). Karnes Co.: Collector undesignated s.n. [Brackenridge Park, 3-13-19] (Wi); J. C. Johnson 1128 (Z), 53-870 (Au--122470). Kaufman Co.: Harold Gentry 2699 (Hi--116717); F. J. Tyler s.n. [vicinity of Terrell, April 23, 1904] (W--500805), s.n. [vicinity of Terrell, May 13, 1904] (W--500806). Kenedy Co.: Harold Gentry 52-667 (Au--122505); Lundell & Lundell 8731* (Mi). Kerr Co.: E. J. Palmer 9278 (Bi, Du--205593, S). Kimble Co.: M. E. Jones 28511 (Po--190055). Kinney Co.: Mearns 1282 (Du--24193, W--229528). Kleberg Co.: M. C. Johnston 53253.19 (Au--122467); J. F. Sinclair s.n. [Kingsville, Spring 1940] (Au); Tharp & York 51-240 (Au--122583, St). Liveoak Co.: Tharp s.n. [March 22, 1931] (Au); Whitehouse s.n. [March 22, 1931] (Sm). Llano Co.: Barkley, Webster, & Tharp 47268 (Au, N); G. L. Fisher s.n. [Bluffton, Apr. 20, 1931] (B, Bt--37796, Gg--222545); M. E. Jones s.n. [Llano Grande, March 27, 1932] (Po--199868); Le Sassier 95 (Au--169654); Rose-Innes & Warnock 793 (Au); Whitehouse s.n. [Enchanted Rock, Spring '31] (Au). Lubbock Co.: Demaree 7450 (Du--205682, W--1699018); Studhalter 1118 (W--1285908). Maverick Co.: Bogusch s.n. [February 17, 1927] (Ob--50827). McCulloch Co.: Studhalter 1106 (W--1285900). McLennan Co.: Ricker 3364 (W--501878). Medina Co.: C. L. Lundell 10981 (N, Rf, Rf, W--1926939). Milam Co.: G. L. Fisher s.n. [Rockdale, Apr. 18, 1931] (Ew). Mitchell Co.: Finley 9a (Au); R. W. Pohl 4843 (Sm). Montague Co.: Whitehouse 15038 (Mi, N). Nolan Co.: V. E. Stanfield 3 (Au). Nueces Co.: E. J. Palmer 11222 (Ca--425654). Palo Pinto Co.: M. Parks s.n. [Palo Pinto, April] (Au). Parker Co.: Shinners 10954 (Tl); Wadsworth s.n. [Milsap, 1930--31] (Au). Randall Co.: Lundell & Lundell 11435 (N, Rf). Reagan Co.: Wild Flower Contest 42 (Au). Red River Co.: Wilfong 16 (Sm). Reeves Co.: Cory 27906 (N); Tracy & Earle 106 (Cm, Tr, W--441808).

Refugio Co.: F. B. Jones 1712 (Ww). San Patricio Co.: Gould & Hycka 8061 (Au--194266); F. B. Jones 1808 (Ww); C. M. Rowell 4776 (Ww), 5258 (Au--195926); E. D. Schulz 845 (Wi); Tharp s.n. [Sinton prairie, 3/23/31] (Au); Williges 25 (Au--175629), 357 (Au--179741). San Saba Co.: Lewis & Oliver 5435 (Nb); B. Norton s.n. [Cherokee, 4-1-1931] (Au); E. J. Palmer 11843 (Au--122568, Ca--425592). Schleicher Co.: Cory 34444 (N, N). Shackelford Co.: N. C. Henderson 63-38 (Au--217675); Rohrbaugh 470 (Ok). Sutton Co.: M. E. Jones 28512 (Po--190054); R. W. Pohl 4759 (Sm); Rohrbaugh 372 (Ok). Tarrant Co.: Killian 6794 (Au, W--1465237); Ruth 110, in part (Cm, Io--113565, Mi, Mi, Rf, Up, Ur, W--1488947). Taylor Co.: Tolstead 7071 (Au, Au, Ca--882801, Mi). Tom Green Co.: Cory 40913 (N, N); Lewis & Oliver 5469 (Nb); Parks & Cory 5620 (Tr), 5621 (Tr). Travis Co.: C. C. Albers 34006 (Au); Armer 5381 (Au, W--1438995), s.n. [Austin, 4-2-29] (Pl--151557); Bodin 217a (W); Bogusch & Molby 3009 (Ur); Bray 98 (N); Ely s.n. [Pilob Knob, 21 March 1954] (Au--122192); E. Hall 431, in part (N, Po--248007, Pr, W), s.n. [Austin, 1872] (W--771876); Herb. Univ. Texas s.n. [Deep Eddy, 4-26-36] (Au, Au, Au, Au); Long & Ferguson s.n. [Bee Creek, 4/13/01] (Au); Martindale s.n. [Austin] (Up--17103); E. J. Palmer 9278 (W--1531907), 9339 (Bi, Du--205592, S, W--1531914), 10003 (W--1532016); Tharp 1362 (Au, W--1114413), 1364 (Au, W--1114415), 44116 (Au, Ca--882798, N), s.n. [Country Club, 3-7-28] (Ca--882800); B. H. Warnock 20623 (Au, N), 46086 (Au, Ok, Vi); York s.n. [Austin, 3-18-08] (Au); M. S. Young 114 (N, Po--161333), 115 (Au, Au, Ur, Vi), s.n. [Deep Eddy, 11/15/13] (Nt), s.n. [2/28/14] (Au, N), s.n. [Sandy Creek, 4/22/15] (Ca--882802), s.n. [Austin, 3/9/18] (Ca--882803), s.n. [Austin, 3-12-18] (Mi, N), s.n. [Austin, 8-25-18] (Au), s.n. [west of IAGN Ry.] (Au). Uvalde Co.: Haliel s.n. [Uvalde, 4/17/31] (Au); H. J. Hamby 573 (Ar--206662); Herb. Hapeman s.n. [April 17, 1934] (S); M. E. Jones 28298 (Po--188288), 28518 (Po--190121); E. J. Palmer 13562, in part (B); Parks & Cory 8392 (Tr--16207). Val Verde Co.: Cory s.n. [Del Rio, 3-17-1927] (Tr, Tr--16206); H. C. Hanson 543 (W--982886); Tharp & Havard 49360 (Au--122559). Walker Co.: E. J. Palmer 13175 (W--1603455). Ward Co.: Lundell & Lundell 11382 (Sm). Webb Co.: M. E. Jones 29189 (Po--199870, Po--199871). Wharton Co.: E. J. Palmer 4840 (Po--217663, W--1581011), 4977 (Po--217662, W--1581010). Wichita Co.: Rohrbaugh 488 (Ok); Whitehouse 9513 (Ca--744571, Mi, N, W--1947162), 9524 (Au--122560, N, Tl), 9664 (N), 9669 (N), 10903 (Sm). Wilbarger Co.: Whitehouse 9817a (Ca--744572, N). Willacy Co.: J. F. Brenckle 47-366 (N); M. C. Johnston 54170 (Au--122468). Williamson Co.: Wolcott 121 (Au). Young Co.: Correll & Johnston 22126 (Ld); Hayes 610 (N); McCart 862 (Nt); Whitehouse 15323 (N). Zavala Co.: Herb. Univ. Texas s.n. [Crystal City, 4-6-1930] (Au); B. Stewart 40

(Ok, Ok). County undetermined: Collector undesignated s.n. [4/14/26] (Sr); Lindheimer III.501 [Herb. Reichenb. f. 92421] (Ca--248243, V, W); Metz 3095 [Texas Military Inst.] (St); Turpin s.n. (Au, Au); C. Wright 1500 [N. Mex.] (Ca--247678, T, T). NEW MEXICO: Eddy Co.: Cory s.n. [Carlsbad, Apr. 1924] (Tr); D. W. Lee 109 (W--1203666). County undetermined: Parry, Bigelow, Wright, & Schott 830, in part [Valley of the Rio Grande below Doñana] (W--56216); Wencurtin s.n. [5-2-1916] (Au). MEXICO: Coahuila: Johnson & Barkley 16205M (Au), 16208M (Au), 16212M (Au), 16247M (Au); Warnock & Barkley 14798M (Au). Nuevo León: Alonis, Johnson, & Barkley 16161M (Au), 16175M (Au); Frye & Frye 2376 (Hp); J. N. Weaver 1033 (W--2134239). Sinaloa: M. E. Jones 23243 (Ca--400867, En--6122, Gg--172668, N). Sonora: H. S. Gentry 1311 (Ca--646302, Fs, Ge, Gg--295540, I, Ka--94678, Me, Me, Mi, N, N, S, S); Rose, Standley, & Russell 12745, in part (N, W--635561). Tamaulipas: Painter & Barkley 14383 (Au). CULTIVATED: Texas: E. Hall s.n. [Austin] (W). LOCALITY OF COLLECTION UNDETERMINED: Edw. Palmer 168 (Sd--6781). MOUNTED CLIPPINGS: Pittonia 5: 137. 1903 (N).

VERBENA PUMILA f. ALBIDA Moldenke, Résumé Suppl. 7: 3, nom. nud. (1963), f. nov.

Haec forma a forma typica speciei corollis albis recedit.

This form differs from the typical form of the species in having white corollas.

The type of the form was collected by Robert Runyon (no. 2499) in open sandy ground, sandy loam soil, on Highway 96 at the edge of Kenedy County at the Willacy County line, at an altitude of 10 meters, Texas, on April 8, 1941, and is deposited in the Britton Herbarium at the New York Botanical Garden. Cory reports that his no. 53500 had the corolla-limb 2--3 mm. wide, but was growing "along with no. 53501 whose corolla-limb is 5 mm. or more wide; frequent on graded roads" in Pecos County, Texas. McKelvey 1931, cited below from Val Verde County, may actually hav been collected in Terrell County, since its labels merely say "between Langtry and Sanderson". Runyon describes the roots of this plant as fibrous, the bark pale-green, the leaves toothed or dissected, and the fruit a cylindric capsule, "frequent in sandy soil, the plants root at the lower nodes. He reports that his no. 2366 was collected on January 17, 1941, in the same locality as the type. About his no. 2359 he says "in the sandy region this plant roots freely at the nodes; it is frequent but not common."

Herbarium material has usually been misidentified and distributed as V. quadrangulata Heller. C. M. Rowell 4776, from San Patricio County, cited herein under V. pumila, bears a notation on its label reading "with pale purple to white corollas".

In all, 11 herbarium specimens, including the type, have been examined by me.

Citations: TEXAS: Bexar Co.: Kidder s.n. [San Antonio, 25 Mch.

1885] (Oa--10739). Cameron Co.: R. Runyon 2366 (N). Kenedy Co.: R. Runyon 2359 (N), 2492 (N--type, N--isotype, N--isotype). Kleberg Co.: Correll & Schweinfurth 15616 (Rf). Pecos Co.: Cory 53500 (Du--362506); Parks & Cory 5610 (Tr). Val Verde Co.: McKelvey 1931 (W--1580366, W--1581390).

VERBENA QUADRANGULATA Heller, Contrib. Herb. Franklin & Marshall Coll. 1: 84--85, pl. 6. 1895.

Synonymy: Helleranthus quadrangulatus (Heller) Small, Fl. Southeast. U. S., ed. 1, 1011 & 1337. 1903. Helleranthus quadrangulatus Small ex Prain, Ind. Kew. Suppl. 3: 87. 1908. Verbena pumila f. albiflora Standl., Field Mus. Publ. Bot. 4: 256. 1929. Verbena quadrangularis Heller ex Moldenke, Résumé Suppl. 2: 13, in syn. 1960 [not V. quadrangularis Vell., 1827]. Verbena guadrangularis Heller ex Moldenke, Résumé Suppl. 6: 10, in syn. 1963. Verbena quandrangulata Heller ex Moldenke, Résumé Suppl. 11: 7, in syn. 1964.

Bibliography: Heller, Contrib. Herb. Franklin & Marshall Coll. 1: 84--85, pl. 6. 1895; J. K. Small, Fl. Southeast. U. S., ed. 1, 1011 & 1337. 1903; Durand & Jacks., Ind. Kew. Suppl. 1: 451. 1906; Prain, Ind. Kew. Suppl. 3: 87. 1908; J. K. Small, Fl. Southeast. U. S., ed. 2, 1011. 1913; Standl., Field Mus. Publ. Bot. 4: 256. 1929; Stapf, Ind. Lond. 6: 431. 1931; Perry, Ann. Mo. Bot. Gard. 20: 245, 248--250, 311, 313--314, 339, & 356. 1933; Cory, Texas Agr. Exp. Sta. Bull. 550: 89. 1937; Moldenke, Prelim. Alph. List Invalid Names 26 & 48. 1940; Moldenke, Suppl. List Invalid Names 3. 1941; Moldenke in Lundell, Fl. Texas 3 (1): 17 & 34--35. 1942; A. M. T. Davis, Study Boscaje La Palma 62. 1942; Moldenke, Alph. List Invalid Names 25 & 50. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 13, 19, & 102. 1942; Moldenke, Alph. List Cit. 1: 91, 111, 125, 126, 130, 162, 176, 269, & 294. 1946; Moldenke, Phytologia 2: 165 (1946) and 2: 328 & 383. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 63. 1948; Moldenke, Wrightia 1: 230. 1948; Moldenke, Alph. List Cit. 2: 393, 398, 469, 492, 493, 496, 522, 527, 554, & 596 (1948), 3: 678, 679, 681, 682, 729, 792, 796, 797, 850, 881, 882, 914, 915, & 942 (1949), and 4: 990--992, 994, 1004, 1099, 1113, 1119, 1129, 1184, 1203, 1212, 1213, 1217, 1241, & 1294. 1949; Moldenke, Phytologia 3: 132. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 14. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 24, 33, & 199. 1949; Shinners, Spring Fl. Dallas 325. 1958; Jones, Rowell, & Johnston, Flow. Pl. & Ferns Tex. Coast. Bend 144. 1961; Moldenke, Résumé 30, 39, 298, 373, & 473. 1959; Moldenke, Résumé Suppl. 2: 13. 1960; Lewis & Oliv., Am. Journ. Bot. 48: 639--641. 1961; Moldenke, Phytologia 8: 123 (1961) and 8: 279 & 424. 1962; Moldenke, Résumé Suppl. 3: 7 (1962) and 6: 3 & 10. 1963; Moldenke, Phytologia 8: 472 (1963) and 9: 17, 24, & 62. 1963.

Illustrations: Heller, Contrib. Herb. Franklin & Marshall Coll. 1: pl. 6. 1895; Lewis & Oliv., Am. Journ. Bot. 48: 640, fig. 3. 1961.

Low annual herb, decumbent or prostrate to ascending, more or less diffusely branched from the base; roots fibrous; stems prostrate to ascending, rooting at the lower nodes, hirsute; bark pale-green; leaves decussate-opposite, broadly ovate, 1--3 cm. long, cuneate at the base and contracted into a very short margined petiole, incised-pinnatifid or 3-cleft, with the lobes again incised, strigose-hirsute on both surfaces; spikes compact, sessile or nearly so, terminal; bractlets narrowly lanceolate, somewhat shorter than the calyx, hirsute,ciliate-margined; flowers inconspicuous, odorless, about 6 mm. long; corolla hypocrateriform, mostly white or whitish, often nearly white but tinged blue, bluish-lavender, or lavender, rarely pink with a white throat, pale-lavender, light-violet, or pale-blue, or even red, its tube slightly longer than the calyx, practically glabrous outside, the limb 2.5—3 mm. wide, the lobes emarginate; anthers unappendaged; ovary surmounted by a subhemispheric-angulate stylopodium; fruiting-calyx 5--6 mm. long, hirsute, particularly along the ribs, its lobes short, subulate-tipped; fruit cylindric, schizocarpous, constricted along the lines of cleavage, the cocci about 4 mm. long, surmounted by a smooth rather obtuse beak, shallowly reticulate-scrobiculate above, longitudinally striate and somewhat abruptly enlarged at the base; chromosome number: n = 10.

The type of this species was collected by Amos Arthur Heller (no. 1388, in part) in open grounds at both the northern and southern ends of the town of Corpus Christi, at an altitude of 10 to 35 feet, Nueces County, Texas, on March 5, 1894, where it was described as being "plentiful", and is deposited in the Britton Herbarium at the New York Botanical Garden, inscribed "Verbena quadrangularis". Material under this collection number on sheet no. 46200 in the Iowa State College herbarium is Cressa aphylla in the Convolvulaceae.

Heller (1895) says: "This most peculiar plant has the habit and general appearance of the species of Verbena which bear rather large and showy flowers, as V. bipinnatifida and V. Aubletia, but its very small flower at once throws it out of that group. Its most striking feature is the shape of its fruit, which is well shown in the accompanying plate. The crown of this curiously shaped seed is much like the four-angled fruit of certain species of Gaura and is hollow. Until the exact limit of Verbena seeds be known, it is provisionally placed under this genus although it is probably an undescribed genus." This doubt on the part of its original author would probably cause some literal interpreters of the International Rules of Botanic Nomenclature to maintain that the binomial has not been validly published by Heller and must be replaced!

It should be noted here that V. quadrangularis Vell. is a synonym of V. bonariensis L. The type of V. pumila f. albiflora was collected by Lydia E. Pagel (no. 2208) at San Antonio, Bexar County, Texas, in the spring of 1926, and is no. 580190 in the herbarium of the Chicago Natural History Museum.

Verbena quadrangulata has been collected in sandy, loose sandy, rocky, clay, limestone, gravel, and grayish calcareous soil, in sandy loam, brownish sandy loam, and dry clay-loam, in loose sand, and on very fine sandy marl hardpan, on limey-clay hillsides, Catahoula tuff, plains, and sandy prairies, at altitudes of 10 to 1000 meters. Collectors have found it in vacant lots and waste places, woods, swales, and fields, mesquite brush and brushland, in waste or open ground, cleared mesquite scrub and open desert scrub, and on road shoulders or sandy road shoulders and caliche slopes, as well as along railroad rights-of-way, flowering from February to June and in November and December, fruiting from March to May and in November and December. In Texas it is described as inhabiting waste and open grounds, fields, and desert scrub, clay slopes, and sandy beaches, blooming from February to August, in the southern and western portions of the state from Pecos and Upton to Cameron and Wharton, north to Tarrant Counties.

In Cameron County Pammel says that "it blooms all winter", Wherry calls it "rare and little known", while Runyon says "frequent throughout this region [Cameron County], sometimes it covers small areas of ground", "abundant" or "very abundant throughout this region", and "an early spring annual with small white flowers". He also claims that it is "frequent on clay slopes and hilltops in Hidalgo and Starr Counties." Warnock reports it "frequent" in Crane County, and Hamby "more or less common" in Webb County. Cannon refers to it as "a weed in orange groves"; Crutchfield & Johnston say "weeds in sandy clay-loam along right-of-way"; McCart found it "in soil grading from pale orange sand to light brownish clay loam"; and Shinners (1958) writes "common in Rio Grande Plain, reported from Tarrant Co., far out of range, probably because of mislabelling of specimen, but possibly introduced". Jones, Rowell, & Johnston (1961) aver that it inhabits "pasture openings, on well-drained sandy or clayey loams and caliche", flowering in spring. F. B. Jones describes it as "locally abundant" in Kleberg County. The only common name reported is "verbena".

In regard to flower color, most collectors fail to mention this on their labels, but it is given as "white" on McKelvey 1786 and R. Runyon 1780, 2183, 2496, & 2561, as "whitish" on Cory 51369, R. Runyon 628, and Turner 4496, as "nearly white, tinged blue" on Lundell & Lundell 9803, as "nearly white, tinged lavender" on Lundell & Lundell 10124 & 10226, as "nearly white, tinged bluish-lavender" on Lundell & Lundell 9790, 9793, 10050, 10078, & 10141, as "pink with white throat" on Ecology Class Univ. Texas s.n. [Pearsall, 2-27-30], as "pale lavender" on C. L. Lundell 10692, as "light-violet, nearly white" on F. D. Jones 1773, and as "pale-blue" on Frye & Frye 2376 and C. L. Lundell 13621. Williams reports "flowers red or white". More field study is indicated before we can be sure if actual color forms are involved here or merely cases of fading due to age.

L. I. Davis, in a letter to me dated March 25, 1942, refers to two forms of this species -- one with the corolla only half as wide as the calyx is long and the other form (from La Joya) with the corolla-limb 6--8 mm. wide and exactly equal to the calyx length. The soil in the two localities, he says, is entirely different.

Material of this species has been misidentified and distributed in herbaria under the names V. ambrosifolia Rydb., V. bipinnatifida Nutt., V. bracteosa Michx., V. canadensis (L.) Britton, V. canescens H.B.K., V. ciliata Benth., V. ciliata var. longidentata Perry, V. pumila Greene, and V. pumila Rydb.

On the other hand, the Fleetwood 3442, Gould & Hycka 8061, Mc Cart 7480, and C. M. Rowell 4776 & 5258, distributed as V. quadrangulata, are actually V. pumila Rydb., while R. Runyon 2359 & 2366 are V. pumila f. albida Moldenke. A. A. Heller 1385 is a mixture with V. ciliata var. longidentata Perry. Croft s.n. [San Diego, 1885] was apparently first identified as V. ciliata Benth., then as V. pumila Rydb., and finally as V. racemosa Eggert by Farwell. Edw. Palmer 1045 was annotated by Perry as "Aff. V. delticola Small" and a pencil notation on the sheet says "seed has commissure long-warty." E. J. Palmer 13562 was cited by Perry as V. pumila, based on St. Louis and Washington specimens, and I annotated the Berlin specimen as V. pumila also. The Washington specimen, however, has been examined by me and is cited below — it has cocci with definite beaks! Similarly, Frye & Frye 2376 was regarded by me as V. pumila, based on Minden and Washington specimens. These two collections bear re-examination. The Lundell & Lundell 10226 collection should also be re-examined, since the Washington sheet of this number definitely does not have beaked cocci and is therefore cited by me as V. pumila. Without mature fruit it is almost impossible to distinguish these two species.

The Herb. Univ. Texas s.n. [3-2-1930], cited below as from Jim Wells County, Texas, may actually have been collected in San Patricio County since its label is inscribed merely "Alice--Mathis", but Dr. Tharp, in a letter to me, states "likely in Jim Wells County"; similarly, Tharp s.n. [4-19-35] and s.n. [Apr. 19, 1931], cited from Jim Wells County, may have been collected in Duval County, since the labels are merely inscribed "Alice--San Diego", although Dr. Tharp, in his letter to me, says "probably Jim Wells County". Hoglund s.n. [4-6-30], cited from Dimmit County, may have come from Zavala, since its label is inscribed merely "Carrizo Spr.--Crystal City"; Hoglund s.n. [4.6.30], cited from Medina County, may have originated in Frio, because its label is inscribed merely "Devine--Dilley"; McKelvey 1786, cited from Webb County, may have been gathered in Bexar County, as its label in inscribed "between Laredo & San Antonio". Tharp 5538, cited below as from Bee County, may have come from Karnes, since its label is inscribed merely "Kennedy--Beeville", although Dr. Tharp, in his letter to me, says "probably Bee County", and Tharp 5610, cited from Karnes County, may actually be from Bee or San Patricio Counties: its label is inscribed "Kennedy--Portland".

Perry (1933) cites the following 22 additional specimens not as yet seen by me: TEXAS: Atascosa Co.: E. J. Palmer 1747 (E). Bexar Co.: Pagel 2208 (F); E. J. Palmer 2039 (G). Cameron Co.: Nealley s.n. [Brazos Santiago, 1889] (F. W). Frio Co.: Eggert s.n. [railroad north of Moore Station, 5 April 1901] (E). Kinney Co.: Trelease 101 (E). Kleberg Co.: High 75 (E). Nueces Co.: A. A. Heller 1388, in part (E--isotype, G--isotype); E. J. Palmer 1046 (G). Uvalde Co.: E. J. Palmer 23592 (E, G). Val Verde Co.: Orcutt s.n. [Devils River, 15 May 1913] (E). Webb Co.: Berlandier "1485 = 225" (G); Eggert s.n. [Laredo, 6 April 1901] (E, G); Orcutt 5542 (E), 5730 (E); J. Reverchon 3902 (E, G). MEXICO: Tamaulipas: Berlandier "3018 = 1518" (E). The Berlandier "1485 = 225", cited by her as from Webb County, may have come from elsewhere, since its label is inscribed "between Laredo and Bejar". Her "Canby 193" is cited below by me as Canby, Sargent, & Trelease 193; her "Nealley s.n." may possibly be the Nealley 114/369 cited below by me; her Croft 78 from "NY" is actually in the Columbia University Herbarium. She says "Verbena quadrangulata is an anomalous species often confused with V. pumila on account of the strong similarity in habit, but is perhaps more closely related to V. delticola, the only other known North American species with a tendency toward developing a nutlet with a beak. The style is enlarged at the base into a persistent subhemispherical body; hence, when the nutlets split apart they appear as if elongated at the apex into a beak-like appendage. Although the anthers are not glandular and the flowers not showy, the species seems to belong to the section Glandularia."

In all, 169 herbarium specimens, including the types of most of the names involved, and 6 mounted illustrations and clippings have been examined by me.

Citations: TEXAS: Bee Co.: Lundell & Lundell 10050 (Ld, N); Tharp 5538 (Au, W--1468817). Bexar Co.: Clare 755 (Hp); J. B. Davy 16 (Ca--25137); Metz 755 (I); E. D. Schulz 475 (W--1074921), 767, in part (W--1243198, Wi), s.n. [May 1921] (Wi), s.n. [so. S. A., 4-15-22] (Au), s.n. [9 mi. so. San Antonio] (Wi). Cameron Co.: M. Cannon s.n. [La Feria, February 25, 1926] (Mi), s.n. [Santa Rosa, February 7, 1927] (Mi, Mi); Cory 51369 (Sm); A. M. Davis s.n. [Olmito, Summer '41] (Au); C. L. Lundell 10692 (N, Rf, W--1926931); Nealley 114/369 (W); L. H. Pammel s.n. [Brownsville, Feb. 12, 1924] (Io), s.n. [Point Isabel, 2-25-29] (Io--114036), s.n. [Rio Hondo, 3-2-29] (Io--114036); R. Runyon 628 (Rr, W--1224221), 1780 (Rr), 2183 (Rr), 2496 (N, N); Schott s.n. [Rio Bravo del Norte, March 1852] (N); Small & Wherry 11903 (N); G. H. Thomas s.n. [Fort Brown] (N); Wherry s.n. [Brownsville, April 14, 1925] (Up). Cherokee Co.: J. F. Brenckle 47-379 (N). Crane Co.: B. H. Warnock 14693 (Rf).

Dimmit Co.: Cory 28067 (N); Hoglund s.n. [Carrizo Spr.--Crystal City, 4.6.30] (Au). Duval Co.: Croft 78 (C, Pa), s.n. [San Diego, 1885] (Mi); M. C. Johnston 54106 (Au--122587); Lewis & Oliver 5409 (Nb); Ramos, Sandoval, & McCart 8007 (Ok). Frio Co.: Ecology Class Univ. Texas s.n. [Dilley, 2.27.30] (Au), s.n. [Pearsall, 2-27-30] (Au); Herb. Univ. Texas s.n. [Dilley, 2-27-1930] (Au), s.n. [Pearsall, 2-27-30] (Au); C. L. Lundell 13621 (Sm). Goliad Co.: C. B. Williams 49 (Au). Hidalgo Co.: Clover 596 (Mi, N); Fleetwood 3200 (Au--180075); Lundell & Lundell 9803 (Ld, N, W--1888830); R. Runyon 2561 (N); B. L. Turner 4496 (Au--168766); Mrs. E. J. Walker 41 (Au, N). Jim Hogg Co.: Salazar, Santos, & McCart 33 (Ok, Ok); Sanchez, Rodriguez, & McCart 8311 (Ok); Tharp, Johnson, & Webster 48-71 (N, St). Jim Wells Co.: Herb. Univ. Texas s.n. [Alice--Mathis, 3-2-1930] (Mi); Lundell & Lundell 10078 (Ld, N); Tharp s.n. [Alice--San Diego, Apr. 19, 1931] (Au), s.n. [Alice--San Diego, 4-19-35] (Mi). Karnes Co.: Tharp 5610 (W--1468818). Kinney Co.: Canby, Sargent, & Trelease 193 (W--369717); Cory 28994 (N). Kleberg Co.: M. C. Johnston 5441 (Au--122588, St), 53253.15 (Au--122589); F. B. Jones 1773 (Ww); R. Runyon 4284 (Mg, N). La Salle Co.: Botello 49 (Ok); Cory 28548 (N); Lundell & Lundell 10141 (Ld, N). Maverick Co.: Havard s.n. [Eagle Pass, April '83] (W--218871, W--250657). McMullen Co.: Thompson & Graham 61 (Au--123196). Medina Co.: Hoglund s.n. [Devile--Dilley, 4.6.30] (Au). Nueces Co.: A. A. Heller 1385, in part (Pl--72008), 1388, in part (C--isotype, Ca--25169--isotype, Ca--104864--isotype, Es--isotype, Io--38745--isotype, Mi--isotype, N--type, N--photo of isotype, Pl--22606--isotype, Se--79860--isotype, Tu--isotype, Ur--isotype, W--48059--isotype, Z--photo of isotype); F. B. Jones 1718b (Ww); S. M. Tracy s.n. [Corpus Christi, 4/6/1905] (Tr, Tr). Pecos Co.: Parks & Cory 18351 (Tr). San Patricio Co.: F. B. Jones 2833 (Ww); E. D. Schulz s.n. [4/22/1938] (Wi); Tharp s.n. [Mathias, 3-2-1930] (N). Starr Co.: Alvarez, Guajardo, Salazar, & McCart 8042 (Ok); Lundell & Lundell 9790 (Ld, N, W--1887592), 9793 (N); McCart 7234 (Ok); Ramos, Sandoval, Salazar, & McCart 7879 (Ok); Tharp, Johnson, & Webster 48-73 (Au--122596, N). Tarrant Co.: Parks & Cory 11278 (Tr). Upton Co.: Lundell & Lundell 10226 (Ld, N, W--1888903). Uvalde Co.: Dobie s.n. [Uvalde, Apr. 13, 1931] (Au); M. E. Jones 28298 (Ca--479296, Du--239730), 28998 (Bm), 98298 (Gg--237850); E. J. Palmer 13562, in part (W--1603456), 33592 (N); Tharp & Havard 49346 (Au--122591). Val Verde Co.: Small & Wherry 12010 (N). Webb Co.: Alvarez, Guajardo, Salazar, & McCart 7632 (Ok); Blair & al. 48-498 (Au--122584); Cantu, Chapa, & McCart 14 (Ok); C. K. Dodge 154 (W--841668); H. J. Hamby 515 (Ar-206561); McCart 7150 (Ok, Ok), 7361 (Ok); McKelvey 1786 (W--

1581389); Edw. Palmer 1046 (Pa); J. Reverchon 3902 (N, Po--64699, W--501157); Shute 51-1714 (Au--122506). Wharton Co.: J. K. Small s.n. [near Wharton, April 12, 1925] (H--43734, Hi--7905, W--1738993, We); Small & Wherry 11824 (N, N). Willacy Co.: J. F. Brenckle 47-465 (N); Cory 51487 (Sm); Lewis & Oliver 5426 (Nb). Zapata Co.: H. J. Hamby 554 (Ar--206670); Herrera & McCart 7699 (Ok); Lundell & Lundell 10124 (Ld, N); McCart 7206 (Ok); Ramos, Sandoval, Salazar, & McCart 7848 (Ok). Zavala Co.: Cory 43814 (Au). County undetermined: Parks & Cory 17841 (Tr--16203). MEXICO: Nuevo León: Frye & Frye 2376 (Se--65763, W--1790996); Edw. Palmer 1045 (W--56162); Webster & Barkley 14508 (W--2134278), 14508a (Au, N). Tamaulipas: Crutchfield & Johnston 5171a (Au--178530). MOUNTED ILLUSTRATIONS: Heller, Contrib. Herb. Franklin & Marshall Coll. 1: pl. 6. 1895 (W, W). MOUNTED CLIPPINGS: Heller, Contrib. Franklin & Marshall Coll. 1: 84--85. 1895 (W, W).

VERBENA RACEMOSA Eggert, Torreya 2: 123. 1902.

Synonymy: Verbena pulchella Greene, Pittonia 5: 136. 1903 [not V. pulchella Sweet, 1829, nor Hort., 1841].

Bibliography: Eggert, Torreya 2: 123. 1902; Greene, Pittonia 5: 136. 1903; Prain, Ind. Kew. Suppl. 3: 187. 1908; Perry, Ann. Mo. Bot. Gard. 20: 312, 332--333, & 356. 1933; Dermen, Cytologia 7: 161--166 & 168, fig. 9 & 25. 1936; Cory, Texas Agr. Exp. Sta. Bull. 550: 89. 1937; Moldenke, Prelim. Alph. List Invalid Names 48. 1940; O. E. Sperry, Sul Ross State Teach. Coll. Bull. 22: 41. 1941; Moldenke in Lundell, Fl. Texas 3 (1): 19 & 44--45. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 13, 14, & 102. 1942; Moldenke, Alph. List Invalid Names 49. 1942; Schnack, Anal. Inst. Fitotéc. Sta. Catalina 4: 18. 1942; Schnack & Covas, Darwiniana 6: 471. 1944; Darlington & Janaki Ammal, Chromosome Atl. 270. 1945; Moldenke, Phytologia 2: 165. 1946; Moldenke, Alph. List Cit. 1: 125--127 (1946) and 2: 478 & 526. 1948; Moldenke, Wrightia 1: 234. 1948; Moldenke, Castanea 13: 112. 1948; Moldenke, Am. Wild Fls. 292 & 450. 1949; Moldenke, Alph. List Cit. 3: 682, 741, 769, 784, 843, 857, 873, 874, 953, 954, 965, & 966 (1949) and 4: 989, 1004, 1007--1009, 1198, 1212, 1213, & 1294. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 24, 25, 33, & 199. 1949; Mc Dougall & Sperry, Pl. Big Bend Natl. Park 146. 1951; Moldenke, Phytologia 5: 330. 1958; Moldenke, Am. Midl. Nat. 59: 349 & 354. 1958; Moldenke, Résumé 30, 31, 39, 373, & 473. 1959; Lewis & Oliv., Am. Journ. Bot. 48: 638--641, fig. 4. 1961; Moldenke, Phytologia 8: 121, 123, & 124 (1961) and 8: 177, 212, & 437. 1962; Moldenke, Résumé 3: 7 (1962) and 5: 4. 1962; Moldenke, Phytologia 9: 16--18, 27, 118, & 202 (1963) and 9: 386. 1964.

Illustrations: Dermen, Cytologia 7: 163, fig. 9, & 165, fig. 25. 1936; Lewis & Oliv., Am. Journ. Bot. 48: 640, fig. 4. 1961.

Usually a small, low, annual herb, hirsute, prostrate to spreading-erect or in erect clumps; stems several from a common base, ascending-erect, branched at the base, pubescent, sometimes blooming when only 2.5 cm. tall; branches procumbent or decumbent to ascending-erect, usually about 25 cm. long; leaves decussate-opposite, small, firm, the lower ones petiolate, the upper sessile; leaf-blades oval or ovate in outline, about 2 cm. long and 1.5 cm. wide, bipinnatifid or trifid, varying to deeply twice 3-parted, with the segments deeply cleft, the ultimate segments linear, somewhat pubescent or hirtellous on both surfaces; spikes terminating the branches, short-pedunculate or subsessile, cylindric, elongating to 4 cm. but still rather dense at maturity; bractlets lanceolate, 4--7 mm. long, scarcely as long as the calyx, acuminate at the apex, ciliate along the margins; calyx 4--6 mm. long, usually surpassing the bractlets, sparsely glandular-hirtellous or rough-hairy, its teeth short, shorter than the tube, acute- or linear-subulate; corolla white or essentially so, sometimes light-blue, lavender-tinted, very pale-lavender, or light-lavender, persistent, about 1 cm. long, its tube 7--9 mm. long, puberulent or glabrous on the outer surface, its limb 2--6 mm. wide; cocci 2--3 mm. long, spreading at the base when mature, reticulate-scrobiculate almost to the base, the commissural faces muricately scabrous; chromosome number: x = 5; n = 10 (Lewis & Oliver) or 2n = 30 (Dermen).

The type of this species was collected by Heinrich Karl Daniel Eggert in low sandy ground in valleys near Sierra Blanca, El Paso County, Texas, on May 15, 1901, and is deposited in the Britton Herbarium at the New York Botanical Garden. Eggert says "In low places on sandy soil, from the vicinity of El Paso to Martin County, Texas. April to June. Verbena racemosa is related to Verbena bipinnatifida with which it has been associated. It differs from the latter species in the narrow leaf-segments and the smaller, pale and persistent corollas. It hybridizes with Verbena Wrightii." This hybrid has not as yet been recognized by me. The only hybrids known to me which involve V. racemosa are with V. canadensis (L.) Britton [=xV. ferax Moldenke] and with V. tenuisecta Briq. [=xV. kondai Moldenke].

The type of V. pulchella of Greene was collected by Samuel Mills Tracy and Franklin Sumner Earle (no. 106a) in the foothills of the Davis Mountains, Jeff Davis County, Texas, in April.

In Texas V. racemosa is said to inhabit deserts, low valleys, and foothills, blooming from January to June, the winter form often blossoming when only an inch tall, in the western and central portions of the state, from El Paso to Brewster to La Salle, Bexar, and Houston Counties. Collectors record it from reddish, limestone, and alluvial soil, foothills and low foothills, valleys and mesa margins, rocky limestone valleys, deserts, borrow pits, and creek floodplains. They have found it on desert or sandy flood flats, dry flats, plains, rocky hillsides, desert mountains, sand and gravel bars, and the shoulders of highways, along draws and ditches, sandy roadsides, and among rock and gravel in xerophytic canyons, at altitudes of 2200 to 8500 feet, flowering and fruiting from December to July. Whitehouse reports that it often forms "large plants 2 feet broad in gravel and sand bed on rocky slopes" in Pecos County; McVaugh calls it "abundant in level grassy bottoms, rocky limestone hills, thorn shrub-grassland community"; Tharp found it "behind spreader dumps [and dams] on slopes and in valleys"; Warnock & McBryde refer to it as "infrequent" in Terrell County. Warnock says that it is "infrequent" in Brewster County, "frequent along highways" in Pecos County, "frequent" in Val Verde County, and "infrequent but widespread along highways in gypsum soil" in Reeves County. Cory 53500 bears a label reading "corolla-limb 2--3 mm. wide; frequent on graded road with no. 53501 in which the corolla-limb is 5 mm. broad or more." O. E. Sperry 493 represents the winter form, the plants actually only an inch or so tall and in full flower in January.

As to the color of the corollas, most collectors who mention it at all claim it to be white or essentially white; on D. S. Correll 20699 it is said to be "whitish", on Warnock & McBryde 14750 "mostly white", on Whitehouse 19633 "nearly white, lavender-tinted", on McVaugh 7940 "very pale-lavender, just off white", on Warnock 47011 "white to light-lavender", and on McVaugh 7951 "varying to pink or blue". Warnock T.46 is said by the collector to have been "slightly white-flowered", whatever that means!

Lewis & Oliver (1961) say "Chromosome counts are recorded previously for 5 of the species listed and agree with our results excepting 2n = 30 for V. racemosa Eggert (Dermen, 1936). Our number of n = 10 suggests 4x and 6x races for the taxon, or, alternately that the binomial refers to 2 distinct species." I might add a third possibility: Dermen's material, which I have not seen, may have been misidentified. Lewis & Oliver's material has been checked by me.

Material of V. racemosa has been misidentified and distributed in herbaria under the names V. ambrosifolia Rydb., V. bipinnatifida Nutt., V. ciliata Benth., V. pubera Greene, V. pumila Rydb., V. pumila f. albiflora Standl., and V. wrightii A. Gray. On the other hand, the O. E. Sperry T.1072, distributed as V. racemosa, is actually V. ambrosifolia Rydb., Hamby 500 and R. F. Smith M.464 are V. ciliata Benth., R. F. Smith M.10 is V. delticola Small, and Cory 53502, Moore & Moore 4, and B. H. Warnock T.45 are V. wrightii f. albiflora Moldenke. Parry, Bigelow, Wright, & Schott 830 is a mixture with V. pumila Rydb.

The McKelvey 1914 collection, cited below as from Val Verde County, Texas, may actually have been gathered in Brewster County, since its label merely reads "between Langtry & Marathon". H. R. Reed 34064 has no locality of collection indicated on its label, but V. L. Cory, in a letter to me dated November 15, 1943, says that it was probably collected in Pecos County — "the plant grows along the highway from Sheffield to Fort Stockton." Tharp & Havard 49294 may have been collected in Culberson County. Cory 34065 has "H. N. Moldenke" inscribed on its label as collector, but this is certainly erroneous.

Perry (1933) cites the following 7 additional specimens not as yet seen by me: TEXAS: El Paso Co.: Eggert s.n. [low valleys near Sierra Blanca, 15 May 1901] (E--isotype, G--isotype); Orcutt 6184 (E). Jeff Davis Co.: Tracy & Earle 106a (F, G). Upton Co.: Cory 664 (G). NEW MEXICO: County undetermined: C. Wright 1501 (G). Her "Parry, Bigelow, Wright & Schott in part" is the 830, in part, cited by me below; the Wright 1498 which she cites from "NY" is actually in the Torrey Herbarium. She says "Fine pubescence, short calyx-teeth, small leaves, and elongated profusely floriferous spikes are the distinctive characters of this species. It is probably a close relative of V. ciliata."

In all, 129 herbarium specimens, including type material of all the names involved, have been examined by me.

Citations: TEXAS: Brewster Co.: D. S. Correll 20699 (Ld); Cory 30083 (N), 30620 (N), 31653 (N), 43930 (Au), 53209 (Ca--735349, Du--320340, Sm, W--1946557); Cottam 10305 (Fs); Goodman & Waterfall 4574 (Ok, St); Rose-Innes & Warnock 527 (Au, N), 21430 (Au); O. E. Sperry 493 (Fs), 614 (W--1699350), 625 (Om, W--1699359), 1380 (Om, W--1731035), 1734 (Om), T.1071 (Ca--882804); Steiger 1275 (N); Tharp & Havard 49307 (Au--122606); B. H. Warnock 418 (Au), 20105 (Au), 47011 (Rf), T.45 (N, N); Warnock & Turner 7654 (Rf, Rf); Waterfall 15852 (St); Whitehouse 19633 (Mi, N). Culberson Co.: O. E. Sperry T.128 (Om, W--1679251). El Paso Co.: Eggert s.n. [15 May 1901] (N--type). Glasscock Co.: Cory 42070 (Au, N). Houston Co.: Molby 7224 (Au). Hudspeth Co.: Tharp & Havard 49294 (Au--122607). Jeff Davis Co.: Cory 52245 (N); Tracy & Earle 106a (Au, Cm, N, Tr, W--441809). LaSalle Co.: Cory 28553 (N). Montgomery Co.: Havard s.n. [Stockton, June 1881] (W--225358). Pecos Co.: Cory 52155 (Sm), 53500 (N, W--1925405), 53501 (N), 53502 (N), s.n. [4-9-1936] (Md); Hinckley 4675 (N); Lundell & Lundell 10190 (Ld, N, W--1887636), 10206 (Ld, N, Rf); R. McVaugh 7940 (Ar--233924, Au--178248, Du--355381, Mi); Nelson & Nelson 4985 (W--1974032); H. R. Reed 34064 (N, N); Ripley & Barneby 4188 (Gg--301325, N); Tharp 43-805 (Au, N), 43-806 (Au, N, Ok), 43-807 (Au, N, St), 43-808 (Au, Ca--882806, N, N, W--1888993); Tharp & Havard 49359 (Au--122608); B. H. Warnock 46 (W--1730930), 7692 (Rf, Rf), 13862 (Rf), 46135 (Ok, Rf, S), 46136 (Au, N), T.46 (Au, Au); Whitehouse 19536 (Ca--771833, W--1973847). Presidio Co.: R. McVaugh 7951 (Mi); Steiger 649 (N). Reeves Co.: Correll & Johnston 18576 (Rf); Cory 31309 (N), 52133 (Sm); Earle & Tracy 106 (N); Nelson & Nelson 4985 (Au, Du--331380, Ka), 4995 (Au, Du--331381); Roane 28 (Ar--256371); E. Wall 5, in part (S); B. H. Warnock 8593 (Rf). Terrell Co.: B. H. Warnock 2100 [Parks

& Turner 66] (Au--122575); Warnock & McBryde 14750 (Au--123266). Upton Co.: Cory 5587 (Po--213639). Val Verde Co.: McKelvey 1914 (W--1581343); B. H. Warnock 1400 [Parks & Turner 183] (Au--122576). County undetermined: Schott s.n. [roadside between Indianola & San Antonio] (N). NEW MEXICO: San Miguel Co.: M. L. Campbell s. n. [Pecos Valley, Mar. 1, 1917] (Gg--31296). County undetermined: C. Wright 1498 (T), 1501 (T). MEXICO: Coahuila: Lewis & Oliver 5416 (Nb); Warnock & Barkley 14853M (Au). Nuevo León: Frye & Frye 2425a (Se--65655, W--1791003); Painter, Lucas, & Barkley 14281 (Au). LOCALITY OF COLLECTION UNDETERMINED: Cory 34065 (Ur); Parry, Bigelow, Wright, & Schott 830, in part [Valley of the Rio Grande below Doñana] (W--56216).

VERBENA RADICATA Moldenke, Phytologia 9: 184. 1963.

Synonymy: Verbena radicans Gill. & Hook. in Hook., Bot. Misc. 1: 170. 1829 [not V. radicans Moench, 1794]. Verbena radicans Gill. ex R. A. Phil., Anal. Univ. Chil. 35: 190--191. 1870. Glandularia radicans (Gill. & Hook.) Schnack & Covas, Darwiniana 6: 475. 1944.

Bibliography: Moench, Meth. 369. 1794; Steud., Nom. Bot., ed. 1, 874. 1821; Hook., Bot. Misc. 1: 170. 1829; Maund, Bot. Gard. 5: pl. 106 ["422"]. 1834--1835; G. Don in Loud., Hort. Brit. Suppl. 2: 680. 1839; Steud., Nom. Bot., ed. 2, 2: 750. 1841; D. Dietr., Syn. Pl. 3: 603. 1843; Walp., Repert. 4: 24. 1845; Schau. in A. DC., Prodr. 11: 552. 1847; C. Gay, Hist. Fis. Chile Bot. 5: 12. 1849; R. A. Phil., Anal. Univ. Chil. 35: 190--191. 1870; F. Phil., Cat. Pl. Vasc. Chil. 221. 1881; Hook. f. & Jacks., Ind. Kew. 2: 1179. 1895; Sanzin, Anal. Soc. Cientif. Argent. Buenos Aires 88: 97, 98, 124, 127, & 134. 1919; Stapf, Ind. Lond. 6: 431. 1931; L. H. Bailey, Cat. Florists Handl. Verbenac. mss. 1935; H. S. Marshall, Kew Bull. Misc. Inf. 1936: 94. 1936; Beale, Journ. Genet. 40: 338. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 42, 44, & 102. 1942; Schnack, Anal. Inst, Fitotéc. Sta. Catalina 4: 19. 1942; Schnack & Covas, Darwiniana 6: 475. 1944; Cabrera, Bol. Argent. Soc. Bot. 1: 67. 1945; Darlington & Janaki Ammal, Chromosome Atl. 270. 1945; Schnack & Covas, Darwiniana 7: 71, 72, 74, & 75, pl. 4B. 1945; Ind. Taxonom. 1 (14-16): 6. 1945; Moldenke, Alph. List Invalid Names Suppl. 1: 10. 1947; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 102, 107, & 199. 1949; Moldenke, Phytologia 3: 290 (1950) and 3: 467. 1951; Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Chile 25: 70. 1951; Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 6: 2209 & 2212. 1951; E. J. Salisb., Ind. Kew. Suppl. 11: 101. 1953; Moldenke, Résumé 122, 128, 224, 296, & 473. 1959; T. H. Everett, New Illustr. Encycl. Gard. 13: 2406. 1960; Moldenke, Résumé Suppl. 2: 13. 1960; Moldenke, Phytologia 8: 123 (1961) and 8: 203 & 204. 1962; Moldenke, Résumé Suppl. 3: 40 (1962) and 7: 5--7 & 9. 1963; Moldenke, Phytologia 8: 472 (1963), 9: 12, 70, 184, & 192 (1963), and 10: 148. 1964.

Illustrations: Sanzin, Anal. Soc. Cientif. Argent. Buenos Aires 88: 127. 1919; Schnack & Covas, Darwiniana 7: pl. 4B. 1945.

Procumbent or creeping suffruticose perennial; stems rooting at the nodes; leaves decussate-opposite, somewhat fleshy; leaf-blades trifid, completely glabrous on both surfaces, the segments again trifid, the lobes oblong-linear; inflorescence spikes short, terminal, subcapitate; bractlets half as long as the calyx, long-ciliate on the margins; flowers fragrant; calyx about 5 mm. long, short-pubescent on the outer surface; corolla hypocrateriform, varying from blue or bluish-lilac to lilac, violet, or even white, its tube about twice as long as the calyx, puberulent on the outer surface, the limb about 5 mm. wide; chromosome number: 2n = 10.

The type of this little-known species was collected by John Gillies in the Andean valleys near Mendoza, at an altitude of 7000 to 8000 feet, Mendoza, Argentina, and is deposited in the herbarium of the Royal Botanic Gardens at Kew. Hooker says that "This has much the habit of V. microphylla of Humboldt and Kunth, but the leaves are larger, more divided, wholly glabrous, of a yellowish colour when dry, and the spikes are terminal, not axillary. It is remarkably procumbent, and throws out roots abundantly from the lower part of the woody stem." Schauer (1847) says virtually the same: "Habitu prope accedit ad V. microphyllam H. B. Kth., sed folia majora magisque divisa glaberrima, exsiccata flavicantia," and "Vix diversa a sequenti [V. tenera]." Gay (1849) says "Especie muy distinta de las de esta seccion por ser enteramente glabra. Se halla en las cordilleras entre Santiago y Mendoza."

The species has been collected in sandy playas, on rocky ground, and on montane plains at altitudes of 6000 to 8000 feet, flowering in November to January. As to flower color, Sparre 1329 is said to have had blue flowers, Sparre 1035 bluish-lilac, Lillo 8644 violet, and Sanzin 666 white flowers. The species is said to have been introduced into cultivation in England in 1832, flowering there in summer to autumn, "almost hardy, but cuttings should be wintered in frames". Bailey (1935) reports that its seeds are offered to the trade by the Royal Horticultural Society. Everett (1960) describes the plant as "a vigorous grower that forms a perfect flat carpet of greenery studded with heads of lilac flowers. It is hardy, in sheltered places, as far north as Washington, D. C. This kind is native to the Andes of South America." A common name recorded for it is "smooth verbena".

The name, V. radicans, of Moench, is a synonym of and actually only a new name for V. supina L., apparently proposed by Moench merely because he did not like Linnaeus' epithet. Yet it invalidates the similar binomial proposed by Gillies and Hooker 35 years later. The Loud., Hort. Brit. Suppl. 2: 680 (1839) reference is often credited to W. Baxter, but apparently should be credited to G. Don. The Maund, Bot. Gard. 5: pl. 106 ["422"] (1834—35) color illustration identified and often cited as V. radicans, actually represents V. berterii Spreng.

Herbarium material of V. radicata has been misidentified and distributed in herbaria as V. santiaguensis (Covas & Schnack) Moldenke. On the other hand, the Collector undesignated s.n. [H. H. Loc. 1837], distributed as V. radicans, is actually V. berterii Spreng., while Carette 339 is V. sulphurea var. intermedia Kuntze.

In all, 9 herbarium specimens, including type material of all the names involved, have been examined by me.

Citations: ARGENTINA: Catamarca: Sparre 1035 (S). Mendoza: Carette 339, in part (N); Gillies s.n. [Mendoza] (Lu--isotype); Sanzin 666 [Herb. Osten 12811] (N, Ug). Tucumán: Lillo 8644 [Herb. Osten 8471] (N, Ug); C. C. Olrog s.n. [P. Olrog 95] (Og); Sparre 1329 (S).

VERBENA RADICATA var. GLABRA (Hicken) Moldenke, Phytologia 9: 184. 1963.

Synonymy: Verbena radicans var. glabra Hicken, Darwiniana 1: 66. 1923.

Bibliography: Hicken, Darwiniana 1: 66. 1923; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 44 & 102 (1942) and [ed. 2], 107 & 199. 1949; Moldenke, Résumé 128 & 473. 1959; Moldenke, Phytologia 9: 184. 1963; Moldenke, Résumé Suppl. 7: 6. 1963.

This variety differs from the typical form of the species in having the outer surface of the calyx glabrous or almost glabrous with very few short scattered hairs, the calyx-teeth less ciliate, the bractlets glabrous except for the very minutely ciliate margins, and the anther-glands abortive and difficult to discern. The calyx is to 12 mm. long and the corolla 22--25 mm. long, glabrous on the outer surface.

The type of the variety was collected by Cristóbal María Hicken (no. 32) at Arroyo Calabozo, Argentina, in December, 1911. The variety is known to me only from the original description.

VERBENA RAMBOI Moldenke, Phytologia 3: 427--428. 1951.

Bibliography: Moldenke, Phytologia 3: 427--428 & 454. 1951; Moldenke, Biol. Abstr. 25: 3051. 1951; G. Taylor, Ind. Kew. Suppl. 12: 149. 1959; Moldenke, Résumé 111 & 473. 1959.

Herb, apparently about 30 cm. tall; stems apparently simple, erect, acutely tetragonal, sulcate between the angles toward the apex, more or less scattered-pilose especially on the often margined angles, the hairs between the angles much more minute and appressed, those on the angles white, spreading or reflexed; nodes not annulate; principal internodes 1.5--2 cm. long; leaves decussate-opposite, sessile or practically so; leaf-blades rather grayish-green on both surfaces, chartaceous, elliptic-lanceolate in outline, 2--4.5 cm. long, 5--10 mm. wide, attenuate-acute at the apex, long-attenuate to the base, coarsely incised or incised-serrate with 3--5 teeth on each side at the middle broader portion of the leaf (the larger and lowest lobe-like teeth often again toothed), very sparsely scattered-pilose above with stiff white appressed hairs, more densely so on the larger venation beneath; midrib slender, impressed above, prominent beneath; secondaries slender, about 3 per side, impressed above, prominulous beneath, not extending directly to the tips of the teeth or lobes, but branching early, with the branches extending into the teeth; veinlet reticulation indiscernible on both surfaces; inflorescence terminal, composed of 3 abbreviated spikes; peduncles slender, 1 cm. long or less, acutely tetragonal, whitish-hirsutulous; floriferous portion of the spikes subcylindric, 1--2 cm. long, about 1 cm. wide during anthesis, very densely many-flowered; bractlets lanceolate-ovate, about 5 mm. long, 1 mm. wide at the base, long-attenuate at the apex, subulate-tipped, glabrate except for the long-ciliate margins; calyx cylindric, about 8 mm. long, conspicuously 5-ribbed and white-hirsutulous on the ribs, the rim irregularly subulate-toothed.

The type of this species was collected by my good friend and colleague, Padre Balduin Rambo (no. 25787) -- in whose honor it is named -- in bushy fields at Fazenda Santa Cecilia, near São Gabriel, Rio Grande do Sul, Brazil, on January 15, 1944, and is deposited in the herbarium of the Colegio Anchieta at Porto Alegre, Brazil. In all, 2 herbarium specimens, including the type, and 2 mounted photographs have been examined by me.

Citations: BRAZIL: Rio Grande do Sul: Rambo 25787 (N--isotype, N--photo of type, Rb--type, Z--photo of type).

VERBENA RAMULOSA R. A. Phil., Anal. Univ. Chile 90: 610. 1896.

Bibliography: R. A. Phil., Anal. Univ. Chile 90: 610. 1896; Durand & Jacks., Ind. Kew. Suppl. 1: 451. 1906; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 42 & 102 (1942) and [ed. 2], 102 & 199. 1949; Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Chile 25: 60 & 62, fig. 3. 1951; Moldenke, Résumé 122 & 473. 1959; Muñoz Pizarro, Espec. Plant. Descr. Philippi 111. 1960.

Illustrations: Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Chile 25: 62, fig. 3. 1951.

Low branched subshrub, covered with appressed white hairs, somewhat canescent; branches about 3 cm. long, 3 mm. in diameter at the base; branchlets 3--6 cm. long, sulcate, one produced at each node; principal internodes 6--10 mm. long; leaves minute, very much crowded, obovate in outline, about 5 mm. long and 4 mm. wide, deeply 3-lobed, the lobes rounded, the central one much wider than the lateral ones; the single midrib not prominent; spikes capitate, subsessile, the heads rather dense but few-flowered, usually 8--10-flowered; bractlets lanceolate, green, almost equaling the calyx; calyx reddish, about 3 mm. long, its teeth triangular; corolla-tube pale-rose, twice as long as the calyx.

The type of this little-known species was collected by José Monreal Marin near Angostura de Peine, O'Higgins, Chile, on November 1, 1886, and is deposited in the herbarium of the Museo Nacional de Historia Natural at Santiago, Chile. Philippi says "Se aproxima mucho a la V. microphylla Kth. por sus hojas pequeñas i las espigas casi sésiles, pero las hojas de esta tienen 3 a 5 lineas (5 a 11 milímetros) de largo, i tienen a menudo su lóbulo mediano trífido i los laterales bífidos, i su cáliz mide 3 líneas o sea 6 1/2 milímetros, siendo pues del doble largo que él de la V. ramulosa."

Acevedo de Vargas (1951) suggests that the Collector undesignated s.n. specimen cited below may actually be a clastotype. Thus far, only 2 photographs, including a phototype, have been examined by me.

Citations: CHILE: O'Higgins: Collector undesignated s.n. [Herb. Mus. Nac. Hist. Nat. Chile 54731] (N--photo); Marin s.n. [Herb. Mus. Nac. Hist. Nat. Chile 42511] (N--photo of type).

VERBENA RECTA H.B.K., Nov. Gen. & Sp. Pl. 2: 277. 1818 [not V. recta Caesalp., 1583, nor Dodon., 1583, nor Trag., 1624].

Synonymy: Verbena recta Humb. ex Spreng. in L., Syst. Veg., ed. 16, 2: 748. 1825. Verbena recta Humb. & Bonpl. ex Steud., Nom. Bot., ed. 2, 2: 750. 1841. Verbena recta Humb. & Kunth ex D. Dietr., Syn. Pl. 3: 600. 1843. Verbena recta Kunth ex Schau. in A. DC., Prodr. 11: 546, in syn. 1847. Verbena caroliniana f. recta (Kunth) Loes. in Fedde, Repert. 9: 362. 1911. Verbena caroliniana var. recta (Kunth) Loes. in Fedde, Repert. 9: 362. 1911.

Bibliography: H.B.K., Nov. Gen. & Sp. Pl. 2: 277. 1818; Steud., Nom. Bot., ed. 1, 874. 1821; Steud., Nom. Bot., ed. 2, 2: 750. 1841; D. Dietr., Syn. Pl. 3: 600. 1843; Walp., Repert. 4: 20. 1845; Schau. in A. DC., Prodr. 11: 546. 1847; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 1179. 1895; Loes. in Fedde, Repert. 9: 362. 1911; Perry, Ann. Mo. Bot. Gard. 20: 247, 260, 271--272, & 356. 1933; Moldenke, Prelim. Alph. List Invalid Names 45. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 19 & 102. 1942; Moldenke, Alph. List Invalid Names 46. 1942; Moldenke, Alph. List Cit. 1: 53, 104, 144, & 203 (1946) and 2: 356, 393, 540, 573, & 607. 1948; H. N. & A. L. Moldenke, Pl. Life 2: 44. 1948; Moldenke, Alph. List Cit. 3: 685, 696, 714, 766, 829, 831, & 876 (1949) and 4: 1072, 1171, 1233, & 1303. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 33, 164, & 199. 1949; Moldenke, Sp. Subsp. Cont. Mold. Set 45 [5]. 1951; Moldenke, Inform. Mold. Set 46 Spec. 4. 1951; Moldenke, Phytologia 3: 467. 1951; Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 6: 2209 & 2212. 1951; Rzedowski, Anal. Esc. Nac. Cienc. Biol. 8: 105. 1954; Moldenke, Inform. Mold. Set 49 Spec. 3. 1954; Moldenke, Résumé 40, 224, 361, & 473. 1959; Moldenke, Résumé Suppl. 2: 13 (1960), 4: 18 (1962), 6: 8 (1963), and 7: 9. 1963; Moldenke, Phytologia 8: 487 & 488 (1963), 9: 198 (1963), and 10: 101, 140, & 141. 1964; Moldenke, Résumé Suppl. 8: 6. 1964.

Low, erect, perennial herb; stems erect, 1 to 2 feet tall, reddish, branched, 4-angled, hispidulous or more or less sparsely pilosulous; leaves decussate-opposite; petioles short, margined; leaf-blades thin-textured, lanceolate-oblong to ovate-lanceolate or ovate, 4--9 cm. long, 2--2.5 cm. wide, acute at the apex, sharply and somewhat irregularly serrate or serrate-dentate along the margins, cuneately narrowed into the petiole at the base, strigillose on both surfaces, minutely pustulate above, reticulately veined; spikes numerous, congested at the apices of the stems and branches, short-cylindric, usually densely flowered but not strict, 4--7.5 cm. long, not much elongating after anthesis; bractlets ovate-lanceolate, equaling or a little shorter than the calyx, 1.5--2 mm. long, acuminate at the apex, hispidulous or puberulent like the calyx; corolla hypocrateriform, tiny, purple or magenta-lavender, the tube scarcely surpassing the calyx, the limb inconspicuous, about 1 mm. wide; fruiting-calyx about 2 mm. long, hispidulous, its lobes short, obtuse, mucronate, commonly connivent; cocci trigonous with a convex back, 1.5--2 mm. long, faintly striate, the commissural surfaces meeting at right angles, practically smooth.

The type of this species was collected by Friedrich Heinrich Alexander von Humboldt and Aimé Jacques Alexandre Bonpland (no. 4066) between Pachuca and Cerro Ventoso, Hidalgo, Mexico, and is deposited in the Humboldt Herbarium at the Muséum National d'Histoire Naturelle at Paris.

The species has been collected in llanos, along mountain streams, in moist clay loam, in brown clayish volcanic or dark soil in pine forests, and along grassy roadsides in open pine forests, at altitudes of 7480 to 10,000 feet, flowering in July and August, and fruiting in August. Hinton states that the plant is medicinal. The only common name recorded for it is "verbena". Walpers (1845) classifies it in his Section Verbenaca, Subsection Inermes, Group Foliosae, Subgroup Micranthae, and Secondary Subgroup Holophyllae with 22 other species. Schauer (1847) and Jackson (1895) reduce it to synonymy under V. carolina L. It was introduced into cultivation in or about 1819.

It should be noted here that the V. recta of Caesalpini is a species of Lycopus in the Lamiaceae; V. recta Dodon. and V. recta Trag. are V. officinalis L.; V. recta canadensis etc. Moris., V. recta canadensis seu virginiana maxima, urticae foliis Moris., V. recta canadensis s. virginiana maxima urticae foliis Moris., and V. recta canadensis urticae folio Moris. are all synonyms of V. urticifolia L.

Material of V. recta has been misidentified and distributed in herbaria under the names V. carolina L., V. caroliniana L., V. mexicana L., and V. polystachya H.B.K., or (by Salazar) as "V. polystachya var." and (by Nelson) as "Verbena aff. V. polystachya H.B.K." Kenoyer s.n. [Pedrigal, 7-7-38] is a mixture with V. carolina L., while Herb. Hort. Bot. Genev. s.n. [18 Aug. 1826] is a mixture with V. urticifolia var. leiocarpa Perry & Fernald. The O. M. Clark 7348, cited by me in Phytologia 8: 494 (1963) as V. carolina, seems actually to be V. recta.

Perry (1933) cites the following 8 additional specimens and photographs under V. recta not as yet seen by me: MEXICO: Federal District: Pringle 13597 (G). Hidalgo: Humboldt & Bonpland 4066

(E--photo of type). Morelos: G. L. Fisher 320 (E). Oaxaca: Pringle 4769 (D, E, F, G). Puebla: Orcutt 3950 (F). She cites the Pringle 13596 collection (from Cima Station) as being from the state of México; the Pringle 4769 which she cites from "NY" is actually in the Columbia University herbarium. She comments: "Verbena recta, generally determined in the material at hand as 'aff. V. polystachya HBK.", is easily distinguished from this closely related species by the short hispidulous pubescence, the commonly broader leaves, and the compact cylindrical congested spikes. The floral characters of both are similar, although generally the fruiting calyx of V. carolina is more acutely ovoid and the subtending bract is much sharper at the apex."

In all, 82 herbarium specimens and 2 mounted photographs, including phototypes of all the names involved, have been examined by me.

Citations: MEXICO: Federal District: Barkley, Rowell, & Webster 2422 (Au--123243, N); Bourgeau 117 (Cb); Degener & Degener 26257 (N, W); G. L. Fisher s.n. [San Angel, July 18, 1924] (Hp); Kenoyer s.n. [Pedrigal, 7-7-38] (Fs); Matuda 18986 (N); Moldenke & Moldenke 19848 (B, Es, F, Fy, Lg, Lm, Mg, Mr, N, N, No, Ot, Rs, S, Sm, Ss); Peñalosa 795 (Gg); Pringle 13597 (Au--181778, Cp, Gg--421275, Mi, Rf, S, Vt, W--462777, W--1586738); J. N. Weaver 784 (N, W--2134190). Hidalgo: L. I. Davis 229 (N); Humboldt & Bonpland 4066 [Macbride photos 39478] (Kr--photo of type, N--photo of type); Moldenke & Moldenke 19845 (Es, N); F. Salazar s.n. [Real del Monte, July 12, 1913] (W--1013230). México: Berlandier 1222 (W--1169402); Hinton 4607 (N, W--1844761); E. Lyonnet 601 (N, W--1642926); Matuda 21296 (N), 21301 (N), 21575 (N), 28302 (Cb), 28366 (Cb), 28407 (Cb), 28610 (Cb); Rowell 2050 (N); J. D. Taylor 8 (N). Morelos: G. L. Fisher 320 (W--1207409), s.n. [Aug. 5, 1924] (Mi); Matuda 25597 (Z); Rose & Hay 5310 (W--395067); Wyatt 59 (Cb). Oaxaca: E. W. Nelson 1105 (W--250224); Pringle 4769 (Bm, Br, C, Ca--104877, Cm, Gg--152309, Io--38743, Me, Me, Me, Mm--15392, S, Vt, W--254859, W--1418489). Puebla: O. M. Clark 7348 (N). Vera Cruz: Matuda 1277 (Mi). CULTIVATED: Belgium: Herb. Martens s.n. [h. b. lov. 1840] (Br, Br). Italy: Herb. Harvey s.n. [h. R. P. 1819] (Du--166462). Switzerland: Herb. Hort. Bot. Genev. s.n. [18 Aug. 1826] (W--264565). LOCALITY OF COLLECTION UNDETERMINED: Née 80, in part (Q).

VERBENA REGNELLIANA Moldenke, Phytologia 2: 425--426. 1948.

Bibliography: Moldenke, Phytologia 2: 425--426. 1948; Moldenke, Castanea 13: 117. 1948; Moldenke, Alph. List Cit. 3: 846. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 94 & 199. 1949; E. J. Salisb., Ind. Kew. Suppl. 11: 263. 1953; Moldenke, Résumé 111 & 473. 1959.

Herb; stems often decumbent and rooting at the nodes; branches ascending or erect, obtusely tetragonal, brunnescent in drying, often slightly margined, sparsely pilose or glabrescent; principal internodes 1--7.5 cm. long; nodes annulate; leaves abundant, decussate-opposite, often with a cluster of small ones in their axils, brunnescent in drying; petioles slender, 2--5 mm. long, plainly winged, sparsely pilose; leaf-blades thin-chartaceous, darker above than beneath, ovate in outline, 1.5--4.5 cm. long, 0.8--2.6 cm. wide, irregularly incised, the larger trifid, the lobes often with a single exterior divergent tooth, acute or apiculate, very sparsely pustulate-pilose above with extremely short appressed whitish hairs, sparsely appressed-pilosulous (but not pustulate) on the larger venation and on the margins beneath, the margins usually very slightly revolute; venation mostly indiscernible or obscure above, the midrib and very slender secondaries conspicuously prominulous beneath, but the veinlet reticulation indiscernible; inflorescence spicate, long-pedunculate, terminal and also axillary in the uppermost axils, the floriferous portion apparently short and dense or elongating to about 4 cm. after anthesis; peduncles very slender, brunnescent, 3--7.5 cm. long, very sparsely pilosulous; bractlets ovate-lanceolate, about 3 mm. long and 1 mm. wide, sharply attenuate or subacuminate at the apex, subglabrate except for the ciliate margins and sometimes a very few microscopic hairs at the apex; calyx tubular, about 4 mm. long and 1.3 mm. wide, very sparsely and minutely pilosulous, the teeth about 0.5 mm. long; corolla-tube 5--6 mm. long, sparsely and very minutely pilosulous above the calyx; corolla-limb about 4 mm. wide, minutely pilosulous on the outer surface.

The type of this distinctive species was collected by Anders Fredrik Regnell (no. III.939) -- in whose honor it is named -- on the swampy banks of the rapidly-flowing Rio Verde at Caldas, Minas Gerais, Brazil, on November 20, 1867, and is deposited in the herbarium of the Naturhistoriska Riksmuseum at Stockholm. It is known thus far only from the type collection. In all, 4 herbarium specimens, including the type, and 4 mounted photographs have been examined by me.

Citations: BRAZIL: Minas Gerais: Regnell III.939 (F--photo of type, N--isotype, N--photo of type, S--type, S--isotype, Si--photo of type, Z--photo of type).

VERBENA REICHEI Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Chile 25: 60--62, fig. 3. 1951.

Bibliography: Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Chile 25: 60--62, fig. 3. 1951; Biol. Abstr. 28: 904. 1954; Moldenke, Phytologia 5: 96. 1954; Moldenke, Résumé 122 & 473. 1959; G. Taylor, Ind. Kew. Suppl. 12: 149. 1959.

Illustrations: Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Chile 25: 62, fig. 3. 1951.

Small subshrub, branched from the base; branches ascending or decumbent, about 25 cm. long, hispid, apparently sparsely foliose on the lower parts (at least when dry); leaves separate, sessile, 1—1.7 cm. long, 6—12 mm. wide, obtuse at the apex, revolute along the margins, attenuate at the base, 3—5-fid, pilose, the middle segment larger, broader, and 3-toothed, the pubescence longer and acclinate above, the venation hispid beneath; inflorescence with 1—3 heads at the tips of the branches; bractlets linear-lanceolate, 3—4.5 mm. long, ciliate along the margins; calyx 7—10 mm. long, slightly dilated at the upper part, hispid, the rim with subulate teeth, the larger ones to 2.5 mm. long; corolla glabrous or lightly pubescent (under a handlens), its tube 1—1.3 cm. long; upper stamens usually with exserted anther-appendages; gynoecium included, about 9 mm. long.

Acevedo de Vargas (1951) says: "Esta planta ha sido confundida en el herbario con V. laciniata (V. erinoides), especie que se reconoce fácilmente por ser más o menos hirsuta, por los segmentos de sus hojas más largos y agudos, por los dientes del cáliz más cortos y por los apéndices de las anteras inclusos en el tubo corolar. También presenta cierta semejanza con Verbena araucana Phil., pero el tipo de esta especie, conservado en el Museo, es distinto." She states that the type of V. reichei is sheet no. 68403 in the Santiago herbarium, but she fails to mention the collector's name [presumably Carl Friedrich Reiche, after whom she named the species], locality of collection, or date of collection.

The species is known to me only from the original description.

VERBENA REITZII Moldenke, Phytologia 3: 119--120. 1949.

Bibliography: Moldenke, Phytologia 3: 119—120 (1949) and 3: 289. 1950; E. J. Salisb., Ind. Kew. Suppl. 11: 263. 1953; Angely, Fl. Paran. 7: 6. 1957; Reitz, Sellowia 11: 57 & 134. 1959; Moldenke, Résumé 111 & 473. 1959; Reitz, Sellowia 12: 152. 1960; Moldenke, Phytologia 10: 160. 1964.

Shrubby perennial, about 1 m. tall; stems and branches rather stout, acutely tetragonal, glabrate throughout; branchlets more slender, acutely tetragonal, sulcate between the angles, glabrous and shiny throughout; nodes somewhat annulate; principal internodes 1—3.5 cm. long; leaves numerous, decussate-opposite, sessile; leaf-blades chartaceous, firm, rather uniformly bright-green on both surfaces, narrowly elliptic or oblong, 1.4—4 cm. long, 2—6 mm. wide, acute at the apex, amplexicaul at the base, the upper ones entire, the lower ones rather irregularly sharp-serrate with 1—3 teeth per side, glabrous but very slightly scabrid above; midrib very slender, plane or impressed above, prominent beneath; secondaries 1--5, very slender, ascending, obscure or subimpressed above, subprominulous beneath; vein and veinlet reticulation not visible; inflorescence terminal, spicate, the spikes much abbreviated and almost subcapitate, usually in clusters of 3, 1—1.5 cm. long, densely many-flowered; peduncles slender, much abbreviated, 4—14 mm. long, tetragonal, glabrous; bractlets lanceolate, 3—4 mm. long, 1 mm. wide at the base, regularly tapering to the acute apex, glabrous; calyx tubular, 4—5 mm. long, 5-apiculate, glabrous or microscopically strigillose;

corolla red or indigo, infundibular or hypocrateriform, its tube about 4 mm. long, strigillose, the limb 4--5 mm. wide.

The type of this very distinct species was collected by Raulino Reitz (no. 2366) -- in whose honor it is named -- in a wet campo at Campo dos Padres, at an altitude of 1900 meters, Santa Catarina, Brazil, on December 16, 1948, and is deposited in the Britton Herbarium at the New York Botanical Garden. The species has been found on campos and wet campos, at altitudes of 1400 to 1900 meters, flowering in November and December. Common names recorded for it are "camaradinha", "formosa sem dote", and "jurupeba". Reitz 3663 is marked "typus", but is not the type collection -- perhaps it is a topotype. Herbarium material has been misidentified and distributed in herbaria as V. montevidensis Spreng.

In all, 7 herbarium specimens, including the type, have been examined by me.

Citations: BRAZIL: Santa Catarina: Reitz 2366 (N--type), 2344 (N), 3663 (S), 3726 (S); Smith & Klein 7787 (N, Ok, W--2251312).

VERBENA RIBIFOLIA Walp., Repert. 4: 29. 1844.

Bibliography: Walp., Repert. 4: 29. 1844; Schau. in A. DC., Prodr. 11: 539. 1847; C. Gay, Hist. Fis. Chile Bot. 5: 18--19. 1849; F. Phil., Cat. Pl. Vasc. Chil. 221. 1881; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 147. 1894; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 1179. 1895; Briq., Ann. Conserv. & Jard. Bot. Genèv. 4: 17. 1900; Reiche, Fl. Chile 5: 285 & 286. 1910; Sanzin, Anal. Soc. Cientif. Argent. Buenos Aires 88: 98, 112, & 134. 1919; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 42, 44, & 102. 1942; Moldenke, Alph. List Cit. 1: 40 (1946) and 3: 688. 1949; Moldenke, Phytologia 3: 75 & 76. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 102, 107, & 199. 1949; Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Chile 25: 62--63. 1951; Moldenke, Résumé 122, 128, & 473. 1959; Moldenke, Résumé Suppl. 3: 15 (1962), 4: 5 (1962), and 7: 5. 1963.

Diffuse, branched, and hispidulous or very short-pubescent subshrub, the pubescence grayish-yellow, turning reddish in drying; branches numerous, opposite, ascending or horizontal, often flexuous, cylindric except at the apex, reddish, quite lustrous; branchlets subtetragonal, pubescent; leaves decussate-opposite; petioles short; leaf-blades membranous, slightly grayish, oval, 1.2--2.4 cm. long, 4--14 mm. wide, very obtuse at the apex, trifid or 3--many-lobed, long-cuneate or cuneiform and attenuate into the petiole at the base, the middle segment pinnatifid, the lobes subcuneate, 2- or 3-dentate or irregularly crenate-dentate, revolute along the margins, lineate-rugose and rather scabrous or strigose-hirtous above, shortly hispid or hirsute-subvillous beneath, subcanescent, the venation prominent beneath; spikes solitary, terminal and axillary, short-pedunculate, many-flowered, crowded, subcapitate-ovate or subfastigiate during anthesis, later becoming oblong, pubescent, reddish in drying; peduncles short; bractlets linear or linear-subulate, somewhat shorter than or only one-third as long as the calyx, hirtellous-pubescent; calyx about 6 mm. long, hirtellous-pubescent, the teeth lanceolate, plicate-subulate, deciduous, the posterior one smaller; corolla rose or purple, one-third longer than to twice as long as the calyx, its tube cylindric, glabrous within to the slightly ampliate mouth, puberulous on the outside, the limb small, 5-lobed.

The type of this species was collected by Besser (no. 12) at Concepcion, Chile, and was deposited in the herbarium of the Botanisches Museum at Berlin, now destroyed. Walpers placed the species in his Section Verbenaca, Subsection Inermes, Group Foliosae, Subgroup Macranthae, and Secondary Subgroup Aubletia with ten other species, and says of it "Species habitu peculiari distinctissima. -- V. humifusae Cham. quodammodo affinis." Gay (1849) says "Esta especie, cuyas hojas parecen à las de algunos Groselleros, se cria en Concepcion, cerca de Talca, en los cerros de Talcareque, etc." Reiche (1910) says that it is found in the "Cordilleras de Santiago a Concepcion", but he unites V. foetida R. A. Phil. and V. longavina R. A. Phil. with it as synonyms.

The species has been found at altitudes of 1600 to 2500 meters, flowering from December to February. Material has been misidentified and distributed in herbaria as V. marrubioides Cham. Schauer (1847) cites Filtec s.n. and Besser 133 from Concepcion and Gay s.n. from "In editis Andibus Chilensium". Briquet (1900) cites Wilczek 50 from "Talus de chemin de fer transandin à las Cuevas, sur Mendoza, alt. c. 2300 m." He comments that "Espèce signalée à notre connaissance seulement sur le versant chilien des Andes."

In all, 6 herbarium specimens and 3 mounted photographs, including phototypes, have been examined by me.

Citations: CHILE: Concepcion: Besser 12 [Macbride photos 17443] (Kr--photo of type, N--photo of type, N--photo of type). Curicó: Claude-Joseph 5228 (W--1442668). Santiago: Grandjot & Grandjot 4817a (N); P. Philippi 13 (N). Province undetermined: Gillies s. n. [Chili] (T). ARGENTINA: Catamarca: Cabrera 1099 (N). Salta: Venturi 10047 (W--1591427).

VERBENA RIBIFOLIA f. ALBA Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Santiago 25: 63. 1951.

Bibliography: Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Santiago 25: 63. 1951; Biol. Abstr. 28: 904. 1954; Moldenke, Phytologia 5: 96. 1954; Moldenke, Résumé 122 & 473. 1959; Moldenke, Résumé Suppl. 7: 5. 1963.

This form differs from the typical form of the species in having white corollas.

The type of the form was collected by Christian Ludwig Landbeck at Portazuelo in the Cordillera de Colchagua, Chile, at 5000 to 7000 feet altitude, in December, 1860, and is deposited in the herbarium of the Museo de Historia Natural at Santiago as sheet no. 54669. The taxon is known to me only from the original description.

VERBENA RIBIFOLIA var. FOETIDA (R. A. Phil.) Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Santiago 25: 63. 1951.

Synonymy: Verbena foetida R. A. Phil., Linnaea 29: 19--20. 1857.

Bibliography: R. A. Phil., Linnaea 29: 19--20. 1857; F. Phil., Cat. Pl. Vasc. Chil. 220. 1881; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 1178. 1895; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 42 & 101 (1942) and [ed. 2], 101 & 198. 1949; Moldenke, Alph. List Cit. 3: 696 (1949) and 4: 1298. 1949; Moldenke, Phytologia 3: 290. 1950; Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Santiago 25: 63. 1951; Biol. Abstr. 28: 904. 1954; Moldenke, Phytologia 5: 96. 1954; Moldenke, Résumé 122, 364, & 473. 1959; Muñoz Pizarro, Espec. Plant. Descr. Philippi 111. 1960.

Suffruticose; stems decumbent; branches erect, subterete; "petiolus in foliis inferioribus fere 2/5 hujus longitud. occupat"; leaf-blades about 2.6 cm. long and 1.2 cm. wide, cuneate at the base and attenuate into the petiole, tripartite-pinnatifid, laciniate, revolute along the margins, microscopically strigose above, grayish-pubescent beneath, the segments ovate and obtuse; spikes capitate; bractlets linear, slightly shorter than the calyx; calyx about 6 mm. long, its teeth unequal, the upper ones somewhat larger, "dentium calycinis quartam tubi partem superantibus", subobtuse; corolla rose or "yellow to violet" [Milner], its tube incurved, twice as long as the calyx, about 11 mm. long, setose on the inner surface on the back up to the upper anthers with white retrorse hairs, the lobes of the limb about 2.5 mm. long; stamens included; anther-appendages absent.

The type of this variety was collected by Philibert Germain in the Andes of Linares, Chile, in 1856, and is deposited in the herbarium of the Museo Nacional de Historia Natural at Santiago, Chile. The label on Macbride's photograph no. 34353 of an isotype implies that Philippi was the collector, but this seems to be erroneous. Philippi says of this species: "Differt a V. dissecta pubescentia, bracteis multo longioribus, corolla rosea; a V. erinioide corollis obscure roseis, dentibus calycinis triplo longioribus, obtusiusculis, lobis limbi corollae brevioribus."

The plant has been collected at 1800 meters altitude, blooming in December and January. Material has been misidentified and distributed in herbaria as typical V. ribifolia Walp. In all, 3 herbarium specimens and 3 mounted photographs, including phototypes of both names involved, have been examined by me.

Citations: CHILE: Coquimbo: Milner s.n. [Cordillera de San Fernando] (N). Curicó: Barros Valenzuela 8039 (N); Claude-Joseph 5274 (W--1442689). Linares: Germain s.n. [Andes of Linares, 1856; Herb. Mus. Nac. Hist. Nat. Chile 54666; Macbride photos 34353] (Kr--photo of isotype, N--photo of type, N--photo of isotype).

VERBENA RIBIFOLIA var. LONGAVINA (R. A. Phil.) Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Santiago 25: 64. 1951.

Synonymy: Verbena longavina R. A. Phil., Anal. Univ. Chil. 90: 608. 1896. Verbena longovina R. A. Phil. apud Durand & Jacks., Ind. Kew. Suppl. 1: 451, sphalm. 1906. Verbena longevina R. A. Phil. ex Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 42 & 101, sphalm. 1942.

Bibliography: R. A. Phil., Anal. Univ. Chil. 90: 608. 1896; Durand & Jacks., Ind. Kew. Suppl. 1: 451. 1906; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 42 & 101 (1942) and [ed. 2], 101 & 198. 1949; Moldenke, Phytologia 3: 305. 1950; Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Santiago 25: 64. 1951; Moldenke, Phytologia 5: 96. 1954; Moldenke, Résumé 122, 369, & 473. 1959; Moldenke, Résumé Suppl. 2: 12. 1960; Muñoz Pizarro, Espec. Plant. Descr. Philippi 111. 1960.

Low, shrubby, about 17 cm. tall; branches about 11 cm. long, hirtous, the principal ones about 4 mm. in diameter, the main one cinereous, the younger ones hirtous; petioles about 5.5 mm. long, hirtous; leaf-blades broadly ovate in outline, about 1.6 cm. long and 1.4 cm. wide, 3-parted, strigillose with appressed hairs, the lobes pinnatifidly divided, the middle one twice as large as the lateral ones, with 13--17 lobules, the lateral ones with 5--7 lobules, the laciniations linear, short, obtuse; spikes capitate; peduncles short, only slightly longer than the leaves; bractlets narrow, subequaling the calyx; calyx about 5 mm. long, whitish-hispidulous; corolla rose-colored, puberulous, its tube twice as long as the calyx; anther-appendages subexserted.

The type of this little-known variety was collected by P. Schoenemann at the Longavi hot springs, Linares, Chile, in January, 1888, and is deposited in the herbarium of the Museo Nacional de Historia Natural at Santiago, Chile. The original publication of Philippi is often cited as "Anal. Univ. Santiago" and dated "1895", but apparently in error. The variety is known only from the original collection, flowering in January. Philippi says of it: "Las hojas son mucho mas chicas que las de las especies afines V. erinoides, sulphurea etc." Only a single phototype has been examined by me.

Citations: CHILE: Linares: Schoenemann s.n. [Longavi, Jan. 1888; Herb. Mus. Nac. Hist. Nat. Chile 54663] (N--photo of type).

VERBENA RIGIDA Spreng., Syst. Veg., cur. Post, 4 (2): 230. 1827.

Synonymy: Verbena venosa Gill. & Hook. in Hook., Bot. Misc. 1: 167. 1829. Verbena scaberrima Cham., Linnaea 7: 267--269. 1832. Verbena rugosa D. Don in Sweet, Brit. Flow. Gard. 7 [ser. 2, 4]: pl. 318. 1836 [not V. rugosa Michx., 1947, nor Mill., 1768, nor Muhl., 1809, nor Willd., 1947]. Verbena scabra Marnock, Floricult. Mag. 5: 87, pl. 54, fig. 3. 1840 [not V. scabra Gray, 1959, nor Mihl., 1825, nor Vahl, 1798]. Verbena rugosa G. Don ex Steud., Nom. Bot., ed. 2, 2: 750, in syn. 1841. Verbena doniana Steud., Nom. Bot., ed. 2, 2: 750. 1841. Verbena rugosa Sweet apud Walp., Repert. 4: 27, in syn. 1845. Buchnera montevidensis Spreng. ex Walp., Repert. 4: 27, in syn. 1845. Verbena rugosa Hook. & Grew. ex Kunth, Ind. Sem. Hort. Berol. 7. 1845. Verbena bonariensis γ rigida (Spreng.) Kuntze, Rev. Gen. Pl. 3 (2): 255. 1898. Verbena bonariensis f. robustior Chod., Bull. Herb. Boiss., sér. 2, 2: 817. 1902. Verbena bonariensis var. venosa (Gill. & Hook.) Chod., Bull. Herb. Boiss., sér. 2, 2: 817. 1902. Verbena bonariensis var. venosa f. robustior Chod., Bull. Herb. Boiss., sér. 2, 2: 817. 1902. Verbena bonariensis var. rigida Kuntze apud Briq., Ann. Conserv. & Jard. Bot. Genèv. 7-8: 291. 1904. ?Verbena venosa var. parviflora Thell. & Zimmerm. ex Hegi, Illustr. Fl. Mittel-Eur. 5 (3): 2240. 1927. Verbena rigida (L.) Spreng. apud Small, Man. Southeast. Fl. 1138. 1933. Verbena venosa Gill. ex Gonçalves da Cunha & Gonçalves Sobrinho, Revist. Fac. Cienc. 3: 43. 1938. Verbena venusta Hort. ex Moldenke, Alph. List Invalid Names 51, in syn. 1942. Verbena venosa Hill. & Hook. apud Pittier, Cat. Fl. Venez. 2: 331, sphalm. 1947. Verbena bonariensis var. rigida (Spreng.) Kuntze ex Moldenke, Alph. List Invalid Names Suppl. 1: 22, in syn. 1947. Verbena nervosa Link ex Moldenke, Alph. List Invalid Names Suppl. 1: 25, in syn. 1947 [not V. nervosa Scheele, 1843]. Verbena scabrosa Pyron ex Moldenke, Alph. List Invalid Names Suppl.1: 26, in syn. 1947. Verbena venosa f. umbrosa Osten ex Moldenke, Alph. List Invalid Names Suppl. 1: 27, in syn. 1947. Verbena venosa var. rugosa D. Don ex Moldenke, Alph. List Invalid Names Suppl. 1: 28, in syn. 1947. Verbena vinosa G. & H. ex Moldenke, Alph. List Invalid Names Suppl. 1: 28, in syn. 1947. Verbena bonariensis var. rigida f. latifolia Kuntze ex Moldenke, Résumé 359, in syn. 1959. Verbena rigida Hook. & Gil. ex Moldenke, Résumé 373, in syn. 1959. Verbena venosa f. genuina Osten ex Moldenke, Résumé 378, in syn. 1959. Verbina vinosa Gill. & Hook. ex Moldenke, Résumé 379, in syn. 1959. Verbena rigida R. & P. ex Moldenke, Résumé Suppl. 6: 11, in syn. 1963. Verbena venosa Sweet ex Moldenke, Résumé Suppl. 6: 11, in syn. 1963. Verbena venosa H. & G. ex Moldenke, Résumé Suppl. 7: 10, in syn. 1963.

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Stiff, tufted, rhizomatous or stoloniferous, scabrous-pubescent, perennial herb of erect-spreading habit, usually low, 15 cm. to 1 m. tall, forming wide-spreading clumps, sometimes robust or suffrutescent, with an extensive underground root and rhizome system, the roots fleshy or tuberous, the rhizome creeping or procumbent; stems branched underground, the aerial floriferous ones simple or little branched, usually 2--6.5 dm. tall, herbaceous, ascending or erect, decumbent or creeping at the base, acutely tetragonal, very scabrous-hirsutulous, scabrous-pubescent, or hirtous, abundantly foliose to the middle, about 3 mm. in diameter at the base, the alternate sides sulcate; internodes sometimes greatly elongate; leaves decussate-opposite or approximate, rather dull pale-green, sessile but not connate, remote, rigid or very rigid, oblong to oblong-lanceolate or narrowly obovate, 7.5-10 cm. long, 1--2.5 cm. wide, subcuneate and entire at the base on the lower ones, more or less semi-amplexicaul or subcordate and adnate at the base on the upper ones, acute at the apex, unequally and coarsely subincised-serrate with spreading acuminate teeth, with somewhat revolute margins on older leaves, conspicuously venose, penninerved, scabrous and more or less hispidulous on both surfaces or callose-strigose above and rather shiny beneath and hispidulous only on the veins, lineate-rugose above, rough to the touch; midrib and veins impressed above, prominently reticulate beneath, the primary lateral ones excurrent in the teeth; spikes terminal, in 3's or decussately paniculate, disposed in subternate cymes, short, sessile or the lateral ones pedunculate, fastigiate, usually dense-flowered and congested at first, eventually cylin-